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ABSTRACT

This investigation was designed to identify scales indicative of the development of problem-solving behavior in young children, and to discover whether children of different backgrounds exhibit similarities in the order of development and levels of achievement of problem-solving behaviors. Items from twenty-two tests were selected for use. Conclusions were: a) there are proble-solving skills that develop in the same order among children of extremely different backgrounds; b) there are particular problem-solving skills that develop in a different order for disadvantaged and advantaged children; c) many item sets did not scale reliably for the disadvantaged children. Appendices containing specific data are included. (MS)

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THE DEVELOPMENT OF PROBLEM-SOLVING SKILLS IN EARLY CHILDHOOD

By

Committee on Educational Research
College of Education
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June, 1971

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PART I

INTRODUCTION

During the spring of 1967, the Committee on Educational Research, University of South Carolina, began a long-term investigation of problem-solving ability in young children. The study was funded by Project Head Start and is now in its fourth year of data collection and analysis.

The study was planned to have specific application to certain critical problems in the field of childhood education as well as more general implications for educational theory and practice. Among the immediate goals of the study was the discovery of more effective means of describing the progress of various sub-populations of children with respect to problem-solving abilities. Among the long-term goals of the study were the development of improved testing and measurement techniques and effective curriculum strategies based on these descriptions.

The present document is an initial report of findings resulting from the study and includes a description of the problem addressed, the readiness context for the investigation, the research question and procedures, analysis of the data, conclusions and implications, and recommendations. The several appendices contain procedural information, analysis tables, and supplementary data.

PART II

THE PROBLEM

The present wide-spread interest in the development and evaluation of curricula for pre-school educational programs is a relatively new phenomenon in American society. The importance of early learning has generally been recognized by learning theorists, but the impetus needed for the extensive research necessary in constructing and testing efficient curricula was lacking before the mid 1960's. The focusing of social consciousness on the plight of the disadvantaged child at that time has resulted in great activity in the field during the past four or five years. As Merwin has written:

> The third new area which has prompted a good deal of evaluation activity has been that of early childhood education. An increasing amount of research which points to the severe handicap of children who enter school without a prior stimulating environmental experience has centered much attention on the young child. In the past, designers of educational evaluation, as a rule, have paid little attention to children under the traditional school age. However, when such federal projects as Head Start and various programs sponsored by the Office of Economic Opportunity called for work with children of preschool ages, they prompted a flurry of activity in attempts to do the kind of evaluation that was needed as a basis for planning meaningful educational activities for youngsters in the age group.[1]

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[1] Jack C. Merwin, "Historical Review of Changing Concepts of Evaluation," Educational Evaluation: New Roles, New Means, Sixty-eighth Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1969), p. 20.

The more or less sudden implementation of numerous programs for young children emphasized many areas of disagreement in the field as well as a sparsity of critical information. In general, the goals to be attained by pre-school education have not been clarified; the content of curricula is uncertain; and measurement instruments and strategies do not seem dependable. In a word--and theory notwithstanding--relatively little is known about the manner in which mental development occurs in young children.

The fact becomes readily apparent as efforts are made to evaluate the effectiveness of various intervention programs. All too often anticipated movement on significant dependent variables has not been detected. Programs that would seem on the basis of face validity to make a difference in the intellectual development of children cannot be shown on the basis of empirical evidence to have done so. Some have viewed this as curriculum deficiencies, they have not believed the curricula to be appropriate, whatever the apparent validity. Others have blamed the results on measurement deficiencies. The latter have contended that existing or newly-developed instruments are simply not sensitive enough or that they have been standardized on populations different from those being studied.

However one views the various problems associated with early childhood education, one thing seems true: we are not yet able to describe adequately mental development in the early years. By use of the word, "adequately," the present writers mean with sufficient validity and precision to give fruitful direction and specificity to the work already done and being done in curriculum, instruction, and evaluation.

The problem area, therefore, addressed by the present investigators was that of *describing* mental development--specifically, problem-solving abilities--in young children. Naturally, the inquiry would address the traditional readiness concept but readiness identified through an extensive, inductive-empirical approach. In other words, the initial goal would be to *operationalize* readiness behaviors.

Within the framework of readiness, two considerations were considered of primary importance. These had to do with the comparing and contrasting of defined subpopulations. On the one hand, there was the identification of similarities in development for different subpopulations; and on the other hand, there was the identification of differences in development between and among subpopulations of children. Obviously such information would have important implications for both curriculum and evaluation.

At this point, the present investigators made explicit their view of the readiness concept with definitions and directional assumptions. The position which serves as the context for the presently reported research is the subject of the following section.

PART III

READINESS: THE RESEARCH CONTEXT

The General View of Readiness

The notion that learning takes place most effectively and efficiently when instruction is introduced at the appropriate time is well established among educators and psychologists. There is general agreement as to the importance of identifying "readiness" points for a particular learner with respect to specific tasks or skills to be taught. Thus, there is little argument regarding the general idea of readiness--at least as a hypothetical point on some underlying continuum--and teachers are exhorted to capitalize on "teachable moments."

On the other hand, controversy arises when one moves past such definition-derived statements as, "The concept of readiness simply refers to the adequacy of existing capacity in relation to the demands of a given learning task"[2] and attempts to identify more usefully the concept of readiness. In the matter of delineating causal factors related to readiness or defining readiness points for particular activities, positions vary considerably.

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[2] David P. Ausubel, "What Shall the Schools Teach? Viewpoints from Related Disciplines: Human Growth and Development," Teachers College Record, LX (February, 1959), 247.

Views range from the position that readiness for learning depends entirely upon biological growth (which can only come with the passage of time) to multi-dimensional positions which include all facets of the learner and his environment.

Enumeration of specific traits and influences that are believed to determine a learner's readiness for particular learning would include many items: physical, social, emotional, mental, and so on. The grouping of these specific correlates to readiness into meaningful determinants has been a somewhat arbitrary matter, but classifications generally have grouped them into the two categories of maturation and experience.

Maturation has been defined as a process which depends upon biological rather than experiential factors. Thus viewed, maturation is that development which"...takes place in the demonstrable absence of specific practice experience...those that are attributed to genic influences and/or incidental experience."[3] It is believed that this development "...occurs practically independent of outside stimulation."[4] McCandless has described the process as "...a neuro-physiological-biochemical change from conception to death...which occurs as a function of time or age."[5]

In general, research into the influence of maturation upon readiness has employed one or both of two general strategies. In the first case, the learner is restricted in practice or deprived of relevant experiences. In the second strategy, practice or experience is introduced to the learner at an earlier age than normal.

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[3] Ibid.

[4] D. M. Johnson, Psychology: A Problem-solving Approach (New York: Harper & Brothers, 1961), p. 12.

[5] Boyd R. McCandless, Children and Adolescents (New York: Holt, Rinehart and Winston, 1961), p. 118.

The majority of studies employing the restriction of practice or the deprivation of experience have used animals as subjects, and they have uniformly demonstrated that restriction may cause permanent impairment if the restriction is prolonged beyond a critical period. The phenomenon of imprinting is related to the concept of critical periods in maturation. Information related to restriction and deprivation impairment in humans is very limited and comes from accounts of "wild children" reared in isolation from human contacts and from accounts of infants reared during their first few years without appropriate psychological stimulation.

In some contrast, numerous studies have been conducted with children as subjects to determine the effects of early practice upon functions normally acquired at a later time in the child's life. The results of these studies generally support the importance of added maturation that comes with passage of time and the ineffectiveness of early practice. Studies of this type have led to the acceptance by many educators of the "delaying doctrine" with respect to both motor skills and cognitive processes. They argue that if maturation implies a gradual, biological unfolding, independent of learning and practice; there is little a teacher can do but await some outward manifestation which presumably signifies that the pupil has attained a given maturity level.

Although chronological age and school grade level have both been used as general referents of mental maturation, the most effective methods of measuring mental maturity have centered on the concept of mental age as determined by means of intelligence tests. In reading, for example, estimates have been made on the basis of experimental studies that the optimum-minimum mental age for beginning to read is six and one-half years. Arithmetical topics have also been assigned to specific mental ages: "Multiplication facts should not be taught below a mental age level of eight years, four months..."[6]

The second category of causal or determinant influences on readiness is that of experiences. The great emphasis on preschool education in recent years (Head Start, for example) reflects the importance that educators and the general public have placed on this aspect of the readiness concept. With respect to readiness for reading, Russell has written:

> The teacher cannot just wait for readiness to be achieved. General maturation is important, but the teacher must also provide experiences which contribute to the growth of reading readiness.[7]

Harris indicates that reading readiness is dependent in part on a child's biological growth and in part on his learning experiences.[8]

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[6] Carleton W. Washburne, "The Grade Placement of Arithmetic topics: A Committee of Seven Investigation," Report of the Society's Committee on Arithmetic, 29th Yearbook of the NSSE, Part II (Chicago: University of Chicago Press, 1930), p. 656.

[7] David H. Russell, Children Learn to Read, (2nd ed.) (Waltham, Massachusetts: Blaisdell Publishing Company, 1961), p. 169.

[8] Albert J. Harris, Effective Teaching of Reading (New York: David McKay Company, Inc., 1962), p. 22.

And Ausubel states:

> Whether or not readiness exists does not necessarily depend on maturation alone but in many instances is solely a function of prior learning experience and most typically depends on varying proportions of maturation and learning.[9]

The notion that prior learning experiences is a vital aspect of the readiness concept has been demonstrated, of course, since the beginning of graded textbooks and materials. Logically, the learning of certain materials requires that the learner has become familiar with less complex but related ideas. Gagné has advanced this notion, explicitly, with his concept of task analysis in the construction of curriculum.[10]

The foregoing discussion has been presented in order to outline the general view of readiness held by educators and psychologists at the present time. With the exception of the work being done by Gagné and others working along similar lines, the concept of readiness has not been operationalized in a fashion that has made it of extensive empirical value. That is to say, our knowledge of readiness has not been greatly productive in advancing the practice and understanding of education.

An Operational View of Readiness

In approaching the problem of readiness, the present investigators began with two assumptions that are commonplace and generally accepted by educators and psychologists. The first of these is that the appearance of problem-solving skills in an individual is patterned such that uniquely related skills appear in an easy-to-hard sequence in which the ability to perform a given task occurs prior to the performance of certain more complex tasks. In other words, these skills appear in definable types and in common sequences from easy to difficult within types and across individuals. The second assumption is that the appearance of these skills is a function of both time (maturation) and experience (learning).

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[9] David P. Ausubel, "What Shall the Schools Teach? Viewpoints from Related Disciplines: Human Growth and Development," Teachers College Record, LX (February, 1959), 248.

[10] Robert M. Gagné, "Curriculum Research and the Promotion of learning," Perspectives of Curriculum Evaluation, AERA Monograph Series on Curriculum Evaluation (Chicago: Rand McNally & Company, 1967), I, pp. 20-23.

The two assumptions naturally led to the consideration of readiness in terms of a two-dimensional matrix in which the horizontal axis represented types of related skills (e.g., word fluency, number ability) and the vertical axis represented the sequence of appearance of the skills (easy-to-hard, e.g., addition, subtraction, multiplication, division). If one then could describe the entries in the matrix--the problem-solving skills--in sufficiently operational terms, then extensive, empirical research might lead to a specific body of information related to readiness which could be applied in a practical fashion to instuction and evaluation.

Of course, the idea of describing readiness or mental development with a two-dimensional matrix of "traits" and "levels" of traits was hardly original. But the possibility of operationalizing entries within the cells of the matrix, if awkward or artificial assumptions could be avoided, appeared to be a very fruitful direction for inquiry.

The present investigators then determined that each entry in the matrix would be a description of a unit of behavior or a type of task which an individual either could or could not perform. The behavior would be defined and delimited in terms of a type of problem that the individual would be instructed to solve. Examples of such problems might be: (1) close the door and return to your seat, (2) add five and three, (3) what color is the dress? and (4) compute the hypotenuse of a right triangle. As the matrix would be developed through an empirical investigation, it would not be necessary to make an assumption concerning what "type" of functioning was required for solving a particular problem.

If a large number of problems sufficiently varied in types and levels of difficulty could be presented to a large population of individuals sufficiently varied in levels of mental development, it might be possible to analyze the responses of the individuals in such a way that horizontal (trait) categories might be formed and the problems arranged within the categories in a easy-to-hard sequence. Upon completion, the matrix would be an operational profile of problem-solving development in which the development sequence of skills would circumscribe readiness levels. Not only would the profile provide an operational approach to readiness, but the inductive and empirical nature of the profile could be expected to be of considerable heuristic value.

The problems associated with such a line of inquiry would be numerous and many of them were immediately apparent. First, the selection of appropriately varied tasks to be included would not be easy. Every effort must be made to see that they were as representative of a universe of cognitive and psychomotor problems as possible.

Secondly, the method of administering the problems to individuals must be such that each one could be scored as either an absolute pass or fail with the degree of testing error lowered to a minimum. Finally, a method of analysis must be identified or constructed that would be appropriate for treating dichotomous data in a manner that would result in clusters of scaled tasks without reference to a coordinate variable such as age.

At this point, the methodological problems were becoming at least apparent if not soluble. But there were still major conceptual problems. First, it was necessary to define what was meant by readiness. Continuing to emphasize the operational nature of the inquiry, readiness was defined in the following manner: A readiness behavior is a unit of behavior that an individual performs prior to performing another given unit of behavior. Further, the identification and description of a given readiness behavior was posited as desirable because it precedes the achievement of some objective or goal unit of behavior. An example of a readiness behavior might be the selection of the color red prior to performing the task: "Paint the house red." The point here is that a readiness behavior is always defined in terms of readiness for what? Once the what, or goal behavior is defined, then those behaviors that precede it (by empirical test) are readiness behaviors. When these are sequenced, an investigator theoretically could identify the sequence of readiness behaviors to some goal unit of behavior as well as assess the readiness level of a particular individual with respect to the goal behavior. From a practical viewpoint, the validity of the identification of readiness levels in an empirical investigation would depend upon the inclusion of an appropriately varied (in terms of mental development) population, a precise method of measurement, and a highly sensitive and sophisticated analytic technique. The extent of readiness identification with respect to various goal behaviors would depend on the variety of tasks (in terms of both type and difficulty levels) included in the investigation.

In view of the definition for a readiness behavior offered above, it is important to note that one unit of behavior may precede another unit of behavior for any one of at least three reasons. First, it may be inherent in the organism that he learn one thing before another. Secondly, the necessity of learning one thing before another may be inherent in the subject matter (one must be able to count before going on to other mathematical operations). Finally certain behaviors may precede others in the development of a child because the culture in which the child lives presents experiences in a particular order. Therefore the readiness definition does not posit that one unit of behavior must precede another in order to be identified as a readiness level for that behavior; it is only defined as a behavior that does precede it.

A second conceptual problem was the naivete of the two-dimensional matrix in the first place. Even without the assistance of important theories and major research endeavors, simple speculation would lead to the conclusion that the complexity and efficiency of mental development is much too great to be described usefully with a model so simple. Would it really be possible to separate mental traits into exclusive columns of scaled behaviors in a way that would lead to a useful view of readiness? Is it not possible that a given task that might appear in a category of "number skills" at some level is prerequisite for the learning of some task appearing under "word knowledge" at a higher level?

The learning hierarchies presented by Gagne[11] and others working along similar lines in curriculum and evaluation appeared to offer a much more useful model. Instead of entries in a two dimensional matrix, readiness levels could be described as elements of a readiness network in which the members were related on the basis of the definition of a readiness behavior (a unit of behavior that an individual performs prior to performing another given unit of behavior.) The concept is relatively simple but takes on important implications as the attempt is made to construct it inductively and empirically. The reader will note the similarity of the present writer's position on readiness and that of Gagne's definition of curriculum:

> A curriculum is a sequence of content units arranged in such a way that the learning of each unit may be accomplished as a single act, provided the capabilities described by specified prior units (in the sequence) have already been mastered by the learner. ...A curriculum is specified when (1) the terminal objectives are stated; (2) the sequence of prerequisite capabilities is described; and (3) the initial capabilities assumed to be possessed by the student are identified.[12]

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[11] Robert M. Gagne, "Curriculum Research and the Promotion of Learning," Perspectives of Curriculum Evaluation, AERA Monograph Series on Curriculum Evaluation (Chicago Rand McNally & Company, 1967), I, pp. 20-23.

[12] Ibid.

The present investigators believe that the importance of conducting extensive research in the area of readiness behavior can hardly be overemphasized. If developmental networks of the kind described can be constructed, the impact on education and psychology could be considerable. Obviously, if one can plot how this development takes place, it would then be possible to study why it takes place in this way; inherent in the organism, the society, etc. It appears that a first and necessary step toward this goal is determining developmental sequences, the order in which children in the nation attain problem-solving skills. Not only would this be the initial task, but the identification of these sequences would provide useful information in and of themselves. Important insights into human development could be expected; a basis would be provided for cross-cultural comparisons; relevant data would be provided for improving the measurement of problem-solving skills in young dhildren; and implications for the modification of education curricula may be suggested. The eventual attainment of extensive networks would depend upon this work aside from the immediate usefulness and utility of the scaled items so identified. The following section of the present report describes the research design and procedures used in collecting the data for these scales.

PART IV

THE RESEARCH DESIGN AND PROCEDURES

Rationale

The present investigation was designed to identify scales indicative of the development of problem-solving behavior in young children. The general question to be addressed was: Do children of different backgrounds exhibit similarities in the order of development and levels of achievement of problem-solving behaviors?

In order to answer the question stated above, it appeared necessary to present a large number of children of varied developmental statuses with a variety of problems--both in terms of types and apparent levels of difficulty. These problems or tasks must be logically related to those areas generally defined as cognitive or psychomotor in nature. If these tasks were administered to children in such a way that the child's "maximum performance" or best effort could be elicited and the tasks were discrete in that the child would perform either successfully or unsuccessfully, then the analysis of responses would result in meaningful scales representing developmental continuums.

The question of consistency across sub-cultural groups then could be answered through appropriate analyses. The possibility would exist that certain sequences of tasks (scales) would be consistent across sub-groups and represent developmental "universals." Others might not be consistent and thus would define in a most meaningful manner (for educational purposes) differences among sub-groups. It was on the basis of this general rationale that the Committee on Educational Research proceeded with the design of the investigation.

The Problem Tasks

The first major problem in designing an investigation based on the above rationale was that of identifying a large number of problem-tasks that could be expected to elicit problem-solving behavior from young children. It was considered particularly important that the approach be as inductive with respect to the selection of these tasks as possible. Of critical importance was the necessity of the tasks being varied, both with respect to format and content.

A reasonable approach to the problem appeared to be a review of all available tests and procedures for measuring cognitive and psycho-motor skills in young children. If items on a given test were viewed as tasks independent of other items on the test, it would be possible to assemble the necessary array of problem-tasks. To this end, more than fifty tests were reviewed by the Committee on Educational Research. Outside consultants assisted with the review.

An item classification outline was developed as the tests were reviewed (see Appendix A). Each item on each of the tests was classified according to the type of behavior it appeared to elicit. Through this process, it was possible to select the widest variety of problem-solving tasks and at the same time avoid extensive duplication. See Appendix B for a more detailed statement of the procedures used in selecting the tests and organizing them into "Batteries." At length, items from twenty-two tests were selected for use in the investigation. A listing of these tests appears in Appendix C.

Sample Selection

Three fundamental considerations were paramount in the identification and selection of children to be included in the investigation. These included the age range of children to be tested, the sub-cultural groups to be represented, and the total number of children to be utilized.

With respect to the age range of children to be tested, the decision was made to include principally four, five, and six-year olds. The position was taken that inasmuch as the child would be required to respond to verbal instructions in order to accomplish the majority of the tasks, that this was a feasible and defensible age range to sample. It was also noted that this range could be lowered in subsequent studies on the basis of data obtained in the present investigation.

In view of the nature of the research rationale, it was also necessary to have subjects spread equally across the age range. If traits were to be identified and then scaled in order of the skills included in each, obviously there must be provisions made to insure that traits were being sampled at equal intervals along the developmental continua. Thus, it was decided to divide the age range of four through six years into three month intervals and include the same number of children in each interval. That is to say, there would be the same number of children in the age interval 4.0 - 4.3 months as between 4.4 - 4.6 months and so on.

In the matter of subcultural groups to be represented in the sample, the decision was made to include "disadvantaged" children (as defined by Office of Economic Opportunity guidelines) and "advantaged" children as defined as coming from families within a specified income range.[4] The two groups were further divided into "Northern" and "Southern" with respect to the geographic location of the subjects.

Finally, the total number of children to be included in the sample was determined, to some extent, by the minimum number required in each of the subcultural groups for meaningful analysis and the maximum number considered feasible in view of the extensiveness of the individual items to be administered. The nature and size of the sample is represented schematically in Figure 1 below:

	Economic Background		
Geographic Location	Advantaged	Disadvantaged	Total
North	N=353 Ages 4.0 - 6.11	N=196 Ages 4.0 - 6.11	549
South	N-417 Ages 4.0 - 6.11	N-464 Ages 4.0 - 6.11	881
TOTAL	770	660	1,430

Fig. 1.--Sample Characteristics and Size

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[4] Advantaged Northern, family income of $8,000 to $22,000 per year; Advantaged Southern, family income of $6,000 to $15,000 per year,

Testing Procedures and Controls

Once the various tests to be utilized in the investigation had been identified and the criteria for the sample established, it was necessary to design procedures and field controls that could be expected to yield data essentially free of contamination. These procedures and controls principally were related to the amount and frequency with which subjects would be tested and to the conditions under which tests would be administered.

Inasmuch as twenty-two tests finally were chosen to be administered, no individual child could be expected to undergo such extensive testing in a relatively brief period of time without excessive fatigue. On the other hand, if the time were extended past a month for the testing of one child, there would be a serious question as to whether or not the data from the collective tests could be considered comparable with respect to the developmental continuum. In other words, maturity would become a contaminating factor.

The tests, therefore, were organized into four "batteries," each of which was to be administered to one-fourth of the total sample. In each sub-cultural group, one-fourth of the children across the age range would receive Battery I, one-fourth of the children would receive Battery II and so on. The division into batteries was made in such a way as to vary the types of tests across batteries and to achieve approximately equal administration times (6-7 hours) for each battery.

In order that some basis for relating items across batteries in subsequent studies would exist, two complete tests were designated as "anchor" tests to be administered to each child in the sample. These were common to all children. The two anchor tests were the Stanford-Binet Intelligence Scale (Binet) and the Wechsler Pre-school and Primary Scale of Intelligence (WPPSI). The Binet was selected because it is widely used with pre-school aged children and contains a variety of item types. The WPPSI was selected even though it is a relatively new test (first published in 1966) because of its relationship to another well-known and widely used test, the Wechsler Intelligence Scale for Children. In addition to these, the color items of the Caldwell-Soule Pre-school Inventory were included as anchor items.

In addition to procedures involving the administrative scheduling of the various tests, a number of control procedures were devised to assure consistency of testing conditions and validity of the data collected. These procedures with the variables each was designed to control are presented in some detail in Appendix D. In general, these procedures required that each battery of tests (including the anchor tests) be administered to the same number of children. Anchor tests were to be administered prior to any battery tests, the Binet first and the WPPSI second in all cases. The order of administering the tests in a given battery was to be reversed in the two halves of a sample unit in an attempt to counter-balance whatever practice effects might accrue as a child was administered the tests in series.

When feasible only one child was to be tested in any room at one time, and no testing session was to exceed ninety minutes per day for any child. These two controls were designed respectively to minimize interference during the testing situation and to reduce the possibility of fatigue. No child was to be tested more than three sessions in a given week, but each child was to be administered the anchor tests and the appropriate battery within one month.

Periodic observations of each tester were made in the field, and any deficiencies noted were verified by a second observer and remedied without delay. The Committee on Educational Research took steps to assure the quality of the data to be collected by training all testers to specified criteria and periodically evaluating their performance in the field to ascertain that the test administration criteria were met continually. See Appendix E for a detailed description of procedures used in selecting and training testers. Instruments used in the routine evaluation of testers in training and in the field and the conditions in which the testing took place are in Appendix F. Also included in Appendix F are comments from a report by the Quality Control division concerning the performance of a tester in a typical testing situation.

A third area requiring the development of special procedures was the actual administration of the various test items. Each test was to be administered to each child on an individual basis, but there was a general consensus that disadvantaged youngsters have communication problems in this type of situation. The administration of items according to the test manual's specifications perhaps would very often result in a failure to respond because the child did not understand the test item. This problem led to the development of what was termed "Maximum Performance Testing." The examiner would probe for responses beyond the specifications of the test author's instructions but within the context of the basic intent of the item. This procedure was believed to maximize to whatever extent was possible the likelihood that the youngster would respond if he were capable of responding. The rationale and procedure for "Maximum Performance Testing" are presented in Appendix G.

Once the data from a particular test had been obtained for a child, it was immediately scored and recorded on data sheets in preparation for transfer to computer cards. Control procedures were maintained to insure that the data remained free from scoring and clerical error. These procedures are included in some detail in Appendix H.

PART V

ANALYSIS OF THE DATA

Rationale and Procedures

The general research question was concerned with the possibility of similarities in the order of development and the levels of achievement of problem-solving behaviors in children of different backgrounds. For purposes of the analysis of the data, the general question was sub-divided into the following more specific questions: (1) Do advantaged and disadvantaged children perform similarly with respect to the relative order in which they acquire problem-solving behaviors and (2) Do advantaged and disadvantaged children perform similarly with respect to average group scores on test item sets designed to measure problem-solving behaviors? The latter question was truly a subsidiary one since differences in the performance of advantaged and disadvantaged youngsters with respect to mean score performance is known to be fairly consistently different in favor of the advantaged. The wealth of information available in the present study, however, was such as to indicate the advisability of a systematic comparison through all of the item sets. The former question dealing with the relative order in which these behaviors are acquired was the central question and served as the basis for the possible identification of common scales.

The general strategy of the research required the application of an analysis procedure which would result in the production of estimates of scaling parameters for items within item sets. These scaling parameters would be indicative of the similarity of sequencing within advantaged and disadvantaged subpopulations. The identification of common sequencing across subpopulations within item sets would serve as the basis for the identification of task types which would be common for both groups.

In addition, the problem of more precise measurement of the effects of various curriculum intervention techniques was considered. It is known that existing measurements often fail to show that educational experiences for young children result in significant movement on the traits that published instruments purport to measure. This is particularly true in the case of disadvantaged children. It was the view of the present researchers that one of the principal reasons for such failure was related to the inadequacy of present instruments to locate youngsters with respect to an underlying continuum. If the item sets could be scaled within the structure of some scaling model so as to produce measurements that were of interval scale strength, then the accuracy of the measurements taken for disadvantaged children might be enhanced and potentially the effects of intervention procedures might be better identified. Analysis procedures were developed which would be applied to the individual item sets in order to achieve the above results.

The following steps were taken for each of the several item sets. First, the item sets were subjected to the scaling model analysis separately for advantaged and disadvantaged children. (See "The Analysis Procedures" Appendix I for a full description of the analytical model.) The results of these initial analyses included reliability and item scaling parameter estimates. Additionally, the analyses indicated the extent to which particular items within a set fit the scaling model and might be considered to be measures of the continuum underlying the set.

In the case of each item set, those items which fit the model sufficiently well for the disadvantaged children were identified. Then those items which fit the model for the advantaged children were identified. These two sets of items were then compared to determine which items fit the model in both the case of the advantaged and the disadvantaged. These "commonly-fitting" items were then re-submitted to the scaling analysis procedures which generated new reliability and item scaling parameter estimators.

Two criteria were established to determine whether or not a particular item set at this point would be retained as indicative of commonality of sequential development for advantaged and disadvantaged children. The criteria were as follows:

1. The lower limit of the 95 percent confidence interval of the Kuder-Richardson 20 reliability estimate must be at least .70

2. The lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates for the items obtained from disadvantaged and advantaged subpopulations must be at least .80.

The next step in the analysis procedures was the consideration of the development of interval score conversion tables. For item sets that had been retained as indicative of universality across subpopulations, the interval score conversions from raw scores were reduced to positive integer values. This was done so that the interval scores might be conveniently used for the locating of individuals with respect to the continuum which the item set was presumed to reflect.

As the investigators were also concerned with the measurement of problem-solving development in disadvantaged children, the item sets which had failed to scale in the same way for both groups were analyzed separately for the disadvantaged children. That is to say, the items which were judged to fit the model after the first analysis for disadvantaged children only were re-analyzed in order to produce interval scale conversion parameters to provide more efficient measurement of disadvantaged children with respect to the continua which the various item sets were presumed to measure. The criterion used at this point for retaining a particular set of items was the Kuder-Richardson 20 reliability estimate.

Additionally, comparisons were made of the relative performance of advantaged and disadvantaged children at three points in the analysis procedures outlined above. First a comparison of raw score means was performed for each item set as it appeared intact at the beginning of the analysis. A second comparison was performed on the raw score means based on only those items that fit the model for both groups after the first analysis. Finally, a comparison of the means of the interval scores was performed following the analysis of the items based on a combination of advantaged and disadvantaged children as one analysis group.

Mode of Presentation

A substantial number of item sets were generated through use of the rationale and procedures described on the preceding pages. All together, seventy-one sets of items were analyzed. Nine of these resulted in the generation of scales which were common to both the advantaged and disadvantaged children. Fifteen scaled only for the disadvantaged group with acceptable reliability estimates (KR_{20} greater than .70). Thirty-two scales were identified for the disadvantaged group but reliability estimates became acceptable only when projected on the basis of fifty items. Another seven scales still had less than acceptable reliability estimates even when projected to a group of fifty items. Finally, there were eight scales which had too few items for further analysis after the loss of most of the items because of failure to fit the model. The nine common scales and the fifteen scales for the disadvantaged only will be included in the present document.

To enhance the clarity of the presentation, those item sets which scaled commonly for both the disadvantaged and the advantaged with sufficient reliability are presented first. Those that scaled for only the disadvantaged children follow in a separate grouping. Within these groupings, the present investigators have used the same sequence for organizing the information related to each set. The sets are arbitrarily identified by the order of their presentation, e.g., First Item Set, Second Item Set, etc. Information concerning each set begins with the notation of the test from which the items were taken and a brief description of the item set. These descriptions may seem somewhat arbitrary to the reader but they have been included to allow for a general understanding of the item sets without continued reference to the appendices. This description is followed by an enumeration of the findings and a statement of the conclusions. The statistical data produced by the analyses related to each item set and verbal descriptions of the items are included in the same order in Appendix J. With respect to the verbal descriptions presented in Appendix J, the reader can identify the test and the particular item from the test by noting the "I.D. Label" and referring to Appendix K. In the latter appendix, all 1,875 items used in the study are listed by "I.D. Label," Anchor Group or Battery, and item number in the tests. The tables necessary to convert the raw scores for the twenty-four item sets to interval scores are included in Appendix L.

Group 1: Item Sets Common to Both Groups

First Item Set - Description: Caldwell Preschool Inventory.--The Caldwell Preschool Inventory consists of 85 items separated into three groups: Personal-social Responsiveness, Associative Vocabulary, and Concept Activation.

The Personal-social Responsiveness dimension involves knowledge about the child's own personal world, i.e., name, address, parts of body, friends, as well as the carrying out of simple and complex verbal instructions given by an adult. The associative Vocabulary dimension requires the ability to demonstrate knowledge of the connotation of a word by carrying out some action related to it. This includes simple labeling of geometric figures, supplying verbal or gestural labels for certain functions, actions, events, and time sequences, and being able to describe verbally the essential characteristics of certain social roles. The Concept Activation dimension appears to represent two major categories: ordinal or numerical relations, and sensory attributes such as form, color size, shape, and motion. It involves either being able to call on established concepts to describe or compare attributes (relating shapes to objects, color-names to objects or events) or to execute motorically some kind of spatial concept (reproduction of geometric designs or drawing the human figure).

First Item Set - Findings.--The scaling analysis of the 85 Caldwell Preschool Inventory items showed a reliability for the disadvantaged sample of .952 with 95 percent confidence limits of .963 and .940. The reliability of these items for the advantaged sample was .934

with 95 percent confidence limits of .946 and .920. The number of items meeting the model fit criterion was 67 for disadvantaged and 62 for advantaged children. Of these items 49 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 9.82) in favor of the advantaged group.

The 49 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .937 with 95 percent confidence limits of .951 and .921. The reliability of these items for the advantaged group sample was .913, with 95 percent confidence limits of .930 and .894. Adjusted to a base of 50 items, these reliabilities were, respectively, .938 with 95 percent confidence intervals of .952 and .923 and .915 with 95 percent confidence intervals of .931 and .896.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 9.18) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .923 and .894 respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .814, the 49 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .937 with 95 percent confidence limits of .946 and

.927. The item difficulty indices showed a range from 26 percent to 98 percent with a median value of approximately 78%. Adjusted to a 50 item base the reliability was .938 with 95 percent confidence limits of .947 and .928.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group (z = 8.29).

First Item Set - Conclusions.--The correlation between the 49 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by the Caldwell items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 49 items has a reliability coefficient with a lower 95 percent confidence bound of .927 and a reasonably good range and distribution of item difficulties.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 85 items, upon the means of the 49 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Second Item Set - Description: Primary Mental Abilities Perceptual Speed.--The Perceptual Speed subtest of the Primary Mental Abilities test contains 28 items. Each item consists of a picture of an object or symbol followed by four pictures of similar objects or symbols. The task is to select one of the four pictures which is exactly like the stimulus picture. While the original subtest was intended to be timed (hence the subtest title), it was not timed when administered for our purposes. Thus, this subtest could be said to offer a measure of the ability to recognize likenesses and differences between objects or symbols accurately, but without regard to quickness. An obvious necessity for success in this task is good visual discrimination.

Second Item Set - Findings.--The scaling analysis of the 28 Primary Mental Abilities Perceptual Speed items showed a reliability for the disadvantaged sample of .855 with 95 percent confidence limits of .887 and .819. The reliability of these items for the advantaged sample was .834 with 95 percent confidence limits of .868 and .796. The number of items meeting the model fit criterion was 25 for disadvantaged and 25 for advantaged children. Of these items 23 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 7.88$) in favor of the advantaged group.

The 23 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .835 with 95 percent confidence limits of .873 and .792.

The reliability of these items for the advantaged group sample was .799, with 95 percent confidence limits of .843 and .749. Adjusted to a base of 50 items, these reliabilities were, respectively, .917 with 95 percent confidence intervals of .9 [illegible] .896 with 95 percent confidence intervals of .919 and .871.

A comparison of the raw score means of t [illegible] groups based on the items showed high statistical significance ($z = 7.86$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .792 and .749, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .844, the 23 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .838 with 95 percent confidence limits of .864 and .810. The item difficulty indices showed a range from 48 percent ot 91 percent with a median value of approximately 75 percent. Adjusted to a 50 item base the reliability was .918 with 95 percent confidence limits of .931 and .904.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group ($z = 5.93$).

Second Item Set - Conclusions.--The correlation between the 23 pairs of items easiness parameter estimates derived from advantaged and disadvantaged children was sufficiently high to support the contention that the two populations develop perceptual competencies in the same order. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 23 items has a reliability coefficient with a lower 95 percent confidence bound of .810 but the item difficulties are limited to the easy half of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 28 items, upon the means of the 23 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Third Item Set - Description: Primary Mental Abilities, Number Facility.--The Number Facility subtest of the Primary Mental Abilities test contains 27 items, all of which are presented to the subject verbally. Each item consists of a picture on which are a number of similar objects. At the lower level the child is simply required to count, e.g., (1) Point to THREE scissors and (2) Point to SIX sprinkling cans. At the intermediate level he is required to handle non-numerical quantities and serial position, e.g., (11) Point to MOST of the forks and (12) Point to the NEXT TO THE LAST

FLOWERPOT. At the upper level he is required to do simple arithmetic reasoning, e.g., (26) Betty was playing with her doll buggy. THREE other little girls came with their doll buggies. How many doll buggies were there then? Point to them. (27) If I blow out SIX of these candles, how many will still be lit? Point to them.

In summary, this subtest appears to tap the ability to use number concepts, to solve simple quantitative problems, and to understand and recognize quantitative differences.

Third Item Set - Findings.--The scaling analysis of the 27 Primary Mental Abilities, Number Facility items showed a reliability for the disadvantaged sample of .917 with 95 percent confidence limits of .936 and .895. The reliability of these items for the advantaged sample was .937 with 95 percent confidence limits of .949 and .924. The number of items meeting the model fit criterion was 16 for disadvantaged and 19 for advantaged children. Of these items, 13 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 9.59$) in favor of the advantaged group.

The 13 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .890 with 95 percent confidence limits of .918 and .858. The reliability of these items for the advantaged group sample was .874, with 95 percent confidence limits of .903 and .841. Adjusted to a base of 50 items, these reliabilities were, respectively, .969 with 95 percent confidence intervals of .977 and .960; and .964 with 95 percent confidence intervals of .972 and .955.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 8.45) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .858 and .841, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .895, the 13 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .890 with 95 percent confidence limits of .909 and .869. The item difficulty indices showed a range from 19 percent to 90 percent with a median value of approximately 65 percent. Adjusted to a 50 item base the reliability was .969 with 95 percent confidence limits of .974 and .963.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group (z = 4.34).

Third Item Set - Conclusions.--The correlation between the 13 pairs of items easiness parameter estimates derived from advantaged and disadvantaged children was sufficiently high to support the contention that the two populations develop number facility competencies in the same order. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population.

The resulting scale of the 13 items has a lower 95 percent confidence bound of .869 and a good range and distribution of item difficulties.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 27 items, upon the means of the 13 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Fourth Item Set - Description: Columbia Mental Maturity Scale.--The Columbia Mental Maturity Scale contains 100 items arranged in order of difficulty. The first 57 of these items were used in the present study. Each item is printed on a separate card and consists of a series of from three to five drawings. The task is to select from the series of drawings on each card the one which is different from, or unrelated to, the others in the series. Bases for discrimination involve differences in color, shape, size, function, number, kind, missing parts, and symbolic material. Since the test requires no verbal response and only a minimal motor response it should be quite useful for physically handicapped children. Adequate visual discrimination would seem to be prerequisite to success on this test.

Fourth Item Set - Findings.--The scaling analysis of the 57 Columbia Mental Maturity Scale items showed a reliability for the disadvantaged sample of .954 with 95 percent confidence limits of .964 and .943. The reliability of these items for the advantaged sample was .899 with 95 percent confidence limits of .919 and .877. The number of items meeting the model fit criterion was 47 for disadvantaged and 47 for advantaged children. Of these items, 41 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 8.96) in favor of the advantaged group.

The 41 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .944 with 95 percent confidence limits of .957 and .929. The reliability of these items for the advantaged group sample was .890, with 95 percent confidence limits of .919 and .856. Adjusted to a base of 50 items, these reliabilities were, respectively, .954 with 95 percent confidence intervals of .965 and .941; and .908 with 95 percent confidence intervals of .933 and .880.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 7.78) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .929 and .856, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .824, the 41 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .942 with 95 percent confidence limits of .953 and .930. The item difficulty indices showed a range from 55 percent to 94 percent with a median value of approximately 89 percent. Adjusted to a 50 item base the reliability was .952 with 95 percent confidence limits of .961 and .942.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group (z = 6.55).

Fourth Item Set - Conclusions.--The correlation between the 41 pairs of items easiness parameter estimates derived from advantaged and disadvantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by these items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 41 items has a lower 95 percent confidence bound of .930, but the item difficulties are limited to the easy half of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 57 items, upon the means of the 41 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Fifth Item Set - Description: Draw-A-Person Test.--The Draw-A-Person Test is perhaps the most unusual of the many tests of general ability in terms of basic conception, brevity, and convenience. The child is simply given a pencil and paper and told to ".... make a picture of a person. Make the very best picture you can; take your time and work very carefully."

Scoring is primarily concerned with the ideas portrayed in the drawings rather than with the technical skill of the drawings. There is no interest in evaluating artistic skill, as such. Inclusion and accuracy of detail, and proportion are the important factors.

The Draw-A-Person Test might be said to tap cognitive and psychomotor skills particularly, the ability to form concepts of increasingly abstract character. Subsumed under these skills would be:

(1) the ability to perceive, i.e., to discriminate likenesses and differences,

(2) the ability to abstract, i.e., to classify objects according to such likenesses and differences, and

(3) the ability to generalize, i.e., to assign a new object to a correct class, according to discriminated features, properties, or attributes.

The Draw-A-Person Test appears to be appropriate for children from ages 4 to 14. After about age 14 Draw-A-Person Test scores cease to show increments.

Fifth Item Set - Findings.--The scaling analysis of the 73 items showed a reliability for the disadvantaged sample of .887 with 95 percent confidence limits of .912 and .860. The reliability of these items for the advantaged sample was .900 with 95 percent confidence limits of .920 and .878. The number of items meeting the model fit criterion was 44 for disadvantaged and 57 for advantaged children. Of these items 37 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 5.85$) in favor of the advantaged group.

The 37 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .830 with 95 percent confidence limits of .867 and .788. The reliability of these items for the advantaged group sample was .858, with 95 percent confidence limits of .886 and .827. Adjusted to a base of 50 items, these reliabilities were, respectively, .868 with 95 percent confidence intervals of .897 and .836; and .891 with 95 percent confidence intervals of .913 and .867.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 5.31$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .788 and .827, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .927, the 37 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .852 with 95 percent confidence limits of .874 and .828. The item difficulty indices showed a range from 1 percent to 96 percent with a median value of approximately 9 percent. Adjusted to a 50 item base the reliability was .886 with 95 percent confidence limits of .903 and .868.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group (z = 4.14).

Fifth Item Set - Conclusions.--The correlation between the 37 pairs of items easiness parameter estimates derived from disadvantaged and advantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by these items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 37 items has a reliability coefficient with a lower 95 percent confidence bound of .828 and a good range of item difficulties. These indices, however, tend to the very difficult part of the range.

The data indicated that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 73 items, upon the means of the 37 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Sixth Item Set - Description: Marianne Frostig Developmental Test of Visual Perception.--The Marianne Frostig Developmental Test of Visual Perception employs five different types of items. The eye-motor coordination items require the subject to draw lines either within specified boundaries or between specified points. Some of the lines are to be straight, some curved, some angled. The figure-ground items require the subject to outline certain figures, e.g., stars, crosses, ovals, etc., that are printed within increasingly complex grounds. The constancy of shape items require the subject to identify certain figures, e.g., circles, squares, parallelograms, etc., that are presented in various positions, sizes, shadings, etc. The position in space items require the subject to identify the drawings of common objects that have been rotated or reversed in the context of a series of such objects. The spatial relationships items require the subject to copy forms and patterns using dots as orienting ground. All together there are 72 items that measure visual perceptual, motor coordination ability.

Sixth Item Set - Findings.--The scaling analysis of the 72 items showed a reliability for the disadvantaged sample of .904 with 95 percent confidence limits of .933 and .870. The reliability of these items for the advantaged sample was .916 with 95 percent confidence limits of .931 and .899. The number of items meeting the model fit criterion was 38 for disadvantaged and 39 for advantaged children. Of these items, 21 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 7.49) in favor of the advantaged group.

The 21 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .798 with 95 percent confidence limits of .843 and .747. The reliability of these items for the advantaged group sample was .787, with 95 percent confidence limits of .827 and .742. Adjusted to a base of 50 items, these reliabilities were, respectively, .904 with 95 percent confidence intervals of .925 and .880; and .898 with 95 percent confidence intervals of .917 and .877.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 6.57$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .747 and .742, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .866, the 21 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .810 with 95 percent confidence limits of .838 and .780. The item difficulty indices showed a range from 13 percent to 98 percent with a median value of approximately 74 percent. Adjusted to a 50 item base the reliability was .910 with 95 percent confidence limits of .923 and .896.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group ($z = 6.21$).

Sixth Item Set - Conclusions.--The correlation between the 21 pairs of items easiness parameter estimates derived from disadvantaged and advantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by these items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 21 items has a lower 95 percent confidence bound of .780 and a good range of item difficulties. These indices, however, tend to distribute to the easy end of the scale.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 72 items, upon the means of the 21 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Seventh Item Set - Description: Stanford-Binet Intelligence Scale, Form L-M.--The Stanford-Binet Intelligence Scale, Form L-M, consists of items that represent a heterogeneous set of tasks. For the purposes of the present study items ranging from year II to year VII, inclusively served as the basis for testing. The tasks these items represent are verbal, non-verbal and manipulative. Examples of verbal item types are vocabulary, similarity and differences, comprehension, etc. Non-verbal items include delayed memory for objects and pictures, identification of objects by use, visual discrimination of similar pictures, etc. Manipulative items include button sorting, paper folding, maze tracing and the like. Cultural bias is probably a factor affecting the scores on these items because of the verbal emphasis and type of content that the items represent.

The particular way in which the administration of the tests in this study was accomplished resulted in a total number of items that exceeds the number indicated in the standard version of The Binet. For example items that normally require fewer correct responses for credit than the number of stimuli were administered in their entirety in each case and were scored as if each stimulus was a separate item. Hence, the total number of items associated with this test in this study is 216.

Because the capacity of the scaling program did not permit the analysis of more than ninety-nine items at a time, a division of the Binet items into subgroups was necessary. The item set currently under consideration consists of items derived from Binet items IV-2 through VII-A and also includes the first vocabulary items.

Seventh Item Set - Findings.--The scaling analysis of the 99 items showed a reliability for the disadvantaged sample of .963 with 95 percent confidence limits of .967 and .959. The reliability of these items for the advantaged sample was .947 with 95 percent confidence limits of .952 and .942. The number of items meeting the model fit criterion was 69 for disadvantaged and 62 for advantaged children. Of these items, 48 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 25.13$) in favor of the advantaged group.

The 48 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .939 with 95 percent confidence limits of .946 and .932. The reliability of these items for the advantaged group sample was .870, with 95 percent confidence limits of .883 and .856. Adjusted to a base of 50 items, these reliabilities were, respectively, .941 with 95 percent confidence intervals of .948 and .935; and .875 with 95 percent confidence intervals of .887 and .861.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 22.90) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .932 and .856, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .946, the 48 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .942 with 95 percent confidence limits of .946 and .938. The item difficulty indices showed a range from 10 percent to 97 percent with a median value of approximately 88 percent. Adjusted to a 50 item base the reliability was .944 with 95 percent confidence limits of .948 and .940.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group (z = 24.54).

Seventh Item Set - Conclusions.--The correlation between the 48 pairs of items easiness parameter estimates derived from disadvantaged and advantaged children was sufficiently high to support the contention that the two populations develop competencies represented by these items in the same order. The reliability estimates derived from the two groups were also sufficiently high. Hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 48 items has a lower

95 percent confidence bound of .938 and a good range but a poor distribution of item difficulties; the items tend to be quite easy.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 99 items, upon the means of the 48 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Eighth Item Set - Description: WPPSI Picture Completion.--The WPPSI Picture Completion test consists of 23 pictures, each of which has some important part missing. The cards are presented to the child in numerical order, and he is asked to name or indicate the missing part on each card. Basic perceptual and conceptual abilities are involved in as much as these are needed in the visual recognition and identification of the objects presented. In a broader sense, the test might be said to measure the ability to differentiate essential from nonessential details in a visual stimulus. In order to see what is missing from any particular picture, the subject must first know what that picture represents. For this reason, subjects from limited experiential backgrounds might do poorly on this test.

Eighth Item Set - Findings.--The scaling analysis of the 23 items showed a reliability for the disadvantaged sample of .858 with 95 percent confidence limits of .873 and .842. The reliability of these items for the advantaged sample was .836 with 95 percent confidence limits of .853 and .818. The number of items meeting the model fit criterion was 16 for disadvantaged and 18 for advantaged children. Of these items 12 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 25.87$) in favor of the advantaged group.

The 12 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .769 with 95 percent confidence limits of .795 and .742. The reliability of these items for the advantaged group sample was .730, with 95 percent confidence limits of .758 and .700. Adjusted to a base of 50 items, these reliabilities were, respectively, .933 with 95 percent confidence intervals of .940 and .925; and .919 with 95 percent confidence intervals of .927 and .910.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 23.63$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .742 and .700, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .926, the 12 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .809 with 95 percent confidence limits of .824 and .794. The item difficulty indices showed a range from 5 percent to 98 percent with a median value of approximately 61 percent. Adjusted to a 50 item base the reliability was .946 with 95 percent confidence limits of .950 and .942.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group.

Eighth Item Set - Conclusions.--The correlation between the 12 pairs of items easiness parameter estimates derived from advantaged and disadvantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by these items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 12 items has a lower 95 percent confidence bound of .794 and a good range and distribution of item difficulties.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 23 items, upon the means of the 12 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Ninth Item Set - Description: Minnesota Preschool Scale.--The Minnesota Preschool Scale contains items that are quite heterogeneous in item type. There are verbal, non-verbal and manipulative items. Examples of verbal items include comprehension, absurdities, vocabulary, opposites, sample sentences, etc. Non-verbal items include discrimination and recognition of forms, identification of missing parts in pictures, etc. Manipulative items include imitative drawing, copying geometric designs, block building, picture puzzles, paper folding, etc.

Because of the particular way in which test items were administered and scored in this study, the 26 items of the standard Minnesota Scale were scored as 39 separate items.

Cultural bias is probably a factor affecting the scores on these items because of the verbal emphasis and type of content that the items represent.

Ninth Item Set - Findings.--The scaling analysis of the 89 items showed a reliability for the disadvantaged sample of .922 with 95 percent confidence limits of .938 and .904. The reliability of these items for the advantaged sample was .903 with 95 percent confidence limits of .922 and .882. The number of items meeting the model fit criterion was 58 for disadvantaged and 45 for advantaged children. Of these items 30 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 13.89$) in favor of the advantaged group.

The 30 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .867 with 95 percent confidence limits of .894 and .836. The reliability of these items for the advantaged group sample was .827, with 95 percent confidence limits of .862 and .788. Adjusted to a base of 50 items, these reliabilities were, respectively, .916 with 95 percent confidence intervals of .933 and .897; and .889 with 95 percent confidence intervals of .911 and .864.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 12.55$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for each group was greater than .70, namely .836 and .788, respectively, and since the lower limit of the 95 percent confidence interval of the correlation between the easiness parameter estimates obtained from the two groups was greater than .80, in this case .876, the 30 common items were analyzed by combining the two groups into one. The reliability resulting for these items was .894 with 95 percent confidence limits of .909 and .877. The item difficulty indices showed a range from 11 percent to 99 percent with a median value of approximately 77 percent. Adjusted to a 50 item base the reliability was .934 with 95 percent confidence limits of .943 and .923.

The raw scores were converted to interval scores according to the estimates obtained from the analysis of the two groups combined. A comparison of the difference between the interval score means showed that the advantaged group substantially out-performed the disadvantaged group ($z = 12.53$).

Ninth Item Set - Conclusions.--The correlation between the 30 pairs of items easiness parameter estimates derived from disadvantaged and advantaged children was sufficiently high to support the contention that the two populations develop in the same order the competencies measured by these items. The reliability estimates derived from the two groups were sufficiently high; hence, the items were analyzed and interval score conversions were produced on the basis of a single combined population. The resulting scale of the 30 items has a reliability coefficient with a lower 95 percent confidence bound of .877 and a good range of item difficulties. These indices, however, tend to the easy end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 89 items, upon the means of the 30 items that fit the scaling model for both groups, or upon the means of the interval scores derived from the combined analysis.

Group 2: Item Sets Scaling for Disadvantaged Only

Tenth Item Set - Description: Primary Mental Abilities, Verbal Meaning.--The Verbal Meaning subtest of the Primary Mental Abilities test consists of 42 items, with each item consisting of 4 pictures. At the lower level the items are simply picture vocabulary, e.g., (1) Point to the crown and (2) Point to the dome. At the upper level the child must demonstrate the ability to understand ideas expressed in words, e.g., (42) Early settlers could not get glass for the windows of their cabins. They dipped paper in oil and used this paper to cover the ____________. Point to it. All items are read to the children so that children with reading handicaps should not be penalized. The pictures used for the items are rather small and detailed, which makes good visual discrimination prerequisite for success.

Tenth Item Set - Findings.--The scaling analysis of the 42 Primary Mental Abilities Verbal Meaning items showed a reliability for the disadvantaged sample of .820 with 95 percent confidence limits of .859 and .775. The reliability of these items for the advantaged sample was .869 with 95 percent confidence limits of .894 and .842. The number of items meeting the model fit criterion was 28 for disadvantaged and 33 for advantaged children. Of these items, 24 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 12.09) in favor of the advantaged group.

The 24 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .768 with 95 percent confidence limits of .819 and .710. The reliability of these items for the advantaged group sample was .785, with 95 percent confidence limits of .826 and .739. Adjusted to a base of 50 items, these reliabilities were, respectively, .873 with 95 percent confidence intervals of .901 and .842; and .884 with 95 percent confidence intervals of .906 and .859.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 10.13$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, .614, the items were not analyzed by combining the two groups into one.

The 28 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .775 with 95 percent confidence limits of .824 and .719. The item difficulty indices showed a range from 18 percent to 88 percent with a median value of approximately 60 percent. Adjusted to a 50 item base, the reliability was .860 with 95 percent confidence limits of .891 and .826.

Tenth Item Set - Conclusions.--The correlation between the 24 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Hence, an analysis based on the combined groups was not made.

The 28 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .719. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were good.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 42 items or upon the means of the 24 items that fit the scaling model for both groups.

Eleventh Item Set - Description: Primary Mental Abilities, Spatial Relations.--The Spatial Relations subtest of the Primary Mental Abilities test consists of 24 items. The first 12 items in this subtest require the subject to select one of four geometric designs which, when added to the stimulus design, will complete a square. This seems to require the ability to see part-whole relationships in a visual stimulus. The remaining 12 items consist of geometric designs paired with similar, but incomplete, geometric designs. The child's task is to complete the incomplete design using the completed design as a model. Here again, the ability to see part-whole relationships in a visual stimulus is required. In addition, the child must possess sufficient eye-hand-motor coordination to utilize a pencil in completing the design. For both parts of this subtest adequate visual discrimination is presumed.

Eleventh Item Set - Findings.--The scaling analysis of the 24 Primary Mental Abilities Spatial Relations items showed a reliability for the disadvantaged sample of .860 with 95 percent confidence limits of .891 and .824. The reliability of these items for the advantaged sample was .899 with 95 percent confidence limits of .918 and .878. The number of items meeting the model fit criterion was 19 for disadvantaged and 15 for advantaged children. Of these items, 12 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 9.54$) in favor of the advantaged group.

The 12 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .713 with 95 percent confidence limits of .780 and .635. The reliability of these items for the advantaged group sample was .821, with 95 percent confidence limits of .857 and .781. Adjusted to a base of 50 items, these reliabilities were, respectively, .912 with 95 percent confidence intervals of .932 and .889; and .950 with 95 percent confidence intervals of .960 and .940.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 9.05$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the disadvantaged group was less than .70, namely, .635, and since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, .740, the items were not analyzed by combining the two groups into one.

The 19 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .824 with 95 percent confidence limits of .866 and .782. The item difficulty indices showed a range from 1 percent to 74 percent with a median value of approximately 38 percent. Adjusted to a 50 item base, the reliability was .926 with 95 percent confidence limits of .943 and .908.

Eleventh Item Set - Conclusions.--The correlation between the 12 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Also the reliability estimate for the common items for the disadvantaged group was too small to justify use of the items in a common analysis.

The 19 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .782. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The item difficulties tended to the difficult end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 24 items or upon the means of the 12 items that fit the scaling model for both groups.

Twelfth Item Set - Description: ITPA Auditory-Vocal Association.--The purpose of the Auditory Vocal Association test of the ITPA is to assess the child's ability to relate verbal symbols on a meaningful basis, in this case by analogy. A sentence completion technique is employed in which the child is required to supply the analogous term. The test consists of 26 items, apparently intended to be in order of difficulty from easiest to hardest. Examples of the items are as follows:

1. I sit on a chair. I sleep on a ____________.

13. A boy runs. An old man ______________________.

26. An ocean is deep. A pond is ________________.

In scoring, only verbal responses are credited. Gestures receive no credit. Neither articulatory nor grammatical perfection is required. The task is simply to supply the analogous missing word. Each item is presented verbally to the child and his response is also verbal, thus the effects of reading difficulties should be minimized.

Twelfth Item Set - Findings.--The scaling analysis of the 26 items showed a reliability for the disadvantaged sample of .818 with 95 percent confidence limits of .854 and .778. The reliability of these items for the advantaged sample was .804 with 95 percent confidence limits of .842 and .762. The number of items meeting the model fit criterion was 17 for disadvantaged and 22 for advantaged children. Of these items 14 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 15.58$) in favor of the advantaged group.

The 14 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .760 with 95 percent confidence limits of .809 and .705. The reliability of these items for the advantaged group sample was .742 with 95 percent confidence limits of .795 and .682. Adjusted to a base of 50 items, these reliabilities were, respectively, .919 with 95 percent confidence intervals of .935 and .901; and .911 with 95 percent confidence intervals of .929 and .891.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 14.12) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the advantaged group was less than .70, namely, .682, the items were not analyzed by combining the two groups into one.

The 17 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .786 with 95 percent confidence limits of .829 and .738. The item difficulty indices showed a range from 3 percent to 96 percent with a median value of approximately 51 percent. Adjusted to a 50 item base the reliability was .915 with 95 percent confidence limits of .932 and .896.

Twelfth Item Set - Conclusions.--The reliability estimate for the common items for the advantaged group was too small to justify use of the items in a common analysis.

The 17 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .738. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were good.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 26 items or upon the means of the 14 items that fit the scaling model for both groups.

Thirteenth Item Set - Description: ITPA Auditory Decoding Test.--The Auditory Decoding test of the ITPA assesses the child's ability to comprehend the spoken word. It is assessed by a controlled vocabulary test in which the child is asked to indicate yes or no, either by voice or gesture whether or not a word has been used correctly. The child does not have to define the word.

Examples of these questions are as follows:

1. Do you smoke?
5. Do babies eat?
14. Do children climb?
24. Do penguins wobble?
32. Do carbohydrates nourish?
35. Do meteorites collide?

There are 36 such items, apparently intended to be in order of difficulty from easiest to most difficult. Since it is only necessary for the child to nod yes or no to each item, the effects of reading and vision handicaps should be minimized.

Thirteenth Item Set - Findings.--The scaling analysis of the 36 items showed a reliability for the disadvantaged sample of .876 with 95 percent confidence limits of .901 and .849. The reliability of these items for the advantaged sample was .859 with 95 percent confidence limits of .886 and .829. The number of items meeting the model fit criterion was 25 for disadvantaged and 24 for advantaged children. Of these items, 15 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 15.61) in favor of the advantaged group.

The 15 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .802 with 95 percent confidence limits of .863 and .728. The reliability of these items for the advantaged group sample was .710, with 95 percent confidence limits of .770 and .642. Adjusted to a base of 50 items, these reliabilities were, respectively, .931 with 95 percent confidence intervals of .952 and .906; and .891 with 95 percent confidence intervals of .913 and .866.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 13.59) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the advantaged group was less than .70, namely, .642, and since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, .167, the items were not analyzed by combining the two groups into one.

The 25 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .851 with 95 percent confidence limits of .881 and .818. The item difficulty indices showed a range from 4 percent to 94 percent with a median value of approximately 16 percent. Adjusted to a 50 item base the reliability was .920 with 95 percent confidence limits of .935 and .902.

Thirteenth Item Set - Conclusions.--The correlation between the 15 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Also the reliability estimate for the common items for the advantaged group was too small to justify use of the items in a common analysis.

The 25 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .818. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the difficult end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 36 items or upon the means of the 15 items that fit the scaling model for both groups.

Fourteenth Item Set - Description: ITPA Visual-Motor Sequencing Test.--The Visual-Motor Sequencing test of the ITPA assesses the ability of the child to correctly reproduce a sequence of symbols previously seen. Short-term memory for visual stimuli is tested by requiring the child to duplicate the order of a sequence of pictures or geometrical designs presented to him and then removed. Each item utilizes a certain number and type of picture or form chips and a tray in which to arrange them in a given sequence. The examiner places a given set of chips in a certain sequence in the tray, allows the child to observe this sequence for five seconds, dumps the chips out and requires the child to duplicate the sequence. There are 15 such items arranged in order of increasing difficulty.

Fourteenth Item Set - Findings.--The scaling analysis of the 15 items showed a reliability for the disadvantaged sample of .822 with 95 percent confidence limits of .856 and .782. The reliability of these items for the advantaged sample was .754 with 95 percent confidence limits of .803 and .700. The number of items meeting the model fit criterion was 13 for disadvantaged and 9 for advantaged children. Of these items, 8 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 9.67$) in favor of the advantaged group.

The 8 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .703 with 95 percent confidence limits of .768 and .628. The reliability of these items for the advantaged group sample was .666, with 95 percent confidence limits of .734 and .588. Adjusted to a base of 50 items, these reliabilities were, respectively, .937 with 95 percent confidence intervals of .950 and .922; and .926 with 95 percent confidence intervals of .940 and .910.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 8.45$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for both groups was less than .70, namely, .628 and .588, respectively, the items were not analyzed by combining the two groups into one.

The 13 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .819 with 95 percent confidence limits of .856 and .777. The item difficulty indices showed a range from 2 percent to 98 percent with a median value of approximately 21 percent. Adjusted to a 50 item base the reliability was .946 with 95 percent confidence limits of .957 and .934.

Fourteenth Item Set - Conclusions.--The reliability estimates for the common items for both the disadvantaged and the advantaged groups were too small to justify use of the items in a common analysis.

The 13 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .777. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the difficult end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 15 items or upon the means of the 8 items that fit the scaling model for both groups.

Fifteenth Item Set - Description: ITPA Auditory-Vocal Sequencing.--The Auditory-Vocal Sequencing test of the ITPA assesses the ability of a child to correctly repeat a sequence of symbols previously heard. This is tested by a modified digit repetition test. There are 20 items in this test with the easiest item containing two digits and the most difficult item containing seven digits. The digits are read to the child at the rate of two per second. The child must always repeat the digits in the same order that he heard them.

This test might be more properly referred to as a test of short-term auditory memory for numbers. Adequate hearing ability is an obviously critical factor for success on this test.

Fifteenth Item Set - Findings.--The scaling analysis of the 20 items showed a reliability for the disadvantaged sample of .818 with 95 percent confidence limits of .855 and .777. The reliability of these items for the advantaged sample was .830 with 95 percent confidence limits of .863 and .793. The number of items meeting the model fit criterion was 14 for disadvantaged and 13 for advantaged children. Of these items, 11 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed statistical significance ($z = 2.58$) in favor of the advantaged group.

The 11 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .690 with 95 percent confidence limits of .754 and .618. The reliability of these items for the advantaged group sample was .771, with 95 percent confidence limits of .816 and .720. Adjusted to a base of 50 items, these reliabilities were, respectively, .910 with 95 percent confidence intervals of .928 and .890; and .939 with 95 percent confidence intervals of .950 and .925.

A comparison of the raw score means of the two groups based on the items showed statistical significance ($z = 2.68$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the disadvantaged group was less than .70, namely, .618, the items were not analyzed by combining the two groups into one.

The 14 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .781 with 95 percent confidence limits of .825 and .731. The item difficulty indices showed a range from 1 percent to 99 percent with a median value of approximately 24 percent. Adjusted to a 50 item base the reliability was .927 with 95 percent confidence limits of .942 and .911.

Fifteenth Item Set - Conclusions.--The reliability estimate for the common items for the disadvantaged group was too small to justify use of the items in a common analysis.

The 14 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .731. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the difficult end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a significant extent but not as much as is typical of other item sets. This fact is true whether the comparison is based upon the means of the original 20 items or upon the means of the 11 items that fit the scaling model for both groups.

Sixteenth Item Set - Description: Stanford-Binet Intelligence Scale, Form L-M.--The Stanford-Binet Intelligence Scale, Form L-M consists of items that represent a heterogeneous set of tasks. For the purposes of the present study items ranging from year II to year VII, inclusively served as the basis for testing. The tasks these items represent are verbal, non-verbal and manipulative. Examples of verbal item types are vocabulary, similarity and differences, comprehension, etc. Non-verbal items include delayed memory for objects and pictures, identification of objects by use, visual discrimination of similar pictures, etc. Manipulative items include button sorting, paper folding, maze tracing and the like. Cultural bias is probably a factor affecting the scores on these items because of the verbal emphasis and type of content that the items represent.

The particular way in which the administration of the tests in this study was accomplished resulted in a total number of items that exceeds the number indicated in the standard version of the Binet. For example, items that normally require fewer correct responses for credit than the number of stimuli were administered in their entirety in each case and were scored as if each stimulus was a separate item. Hence, the total number of items associated with this test in this study is 216.

Because the capacity of the scaling program did not permit the analysis of more than ninety-nine items at a time, a division of the Binet items into subgroups was necessary. The item set currently under consideration consists of items derived from Binet items II-1 through IV-6-1A.

Sixteenth Item Set - Findings.--The scaling analysis of the 99 items showed a reliability for the disadvantaged sample of .920 with 95 percent confidence limits of .928 and .911. The reliability of these items for the advantaged sample was .804 with 95 percent confidence limits of .823 and .782. The number of items meeting the model fit criterion was 75 for disadvantaged and 9 for advantaged children. Of these items, none was judged to fit the model for both groups; hence, no further analysis was performed with the advantaged group.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z - 19.71) in favor of the advantaged group.

The 75 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .904 with 95 percent confidence limits of .915 and .893. The item difficulty indices showed a range from 34 percent to 100 percent with a median value of approximately 95 percent. Adjusted to a 50 item base, the reliability was .863 with 95 percent confidence limits of .878 and .847.

Sixteenth Item Set - Conclusions.--Because no items were commonly retained for the advantaged and disadvantaged groups, there was no indication that the two populations develop in the same order the competencies measured by these items; further, no additional analyses were performed for the advantaged group.

The 75 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .893. Because this coefficient was greater than

.70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were poor, the distribution tending to the easy end of the range.

Based on the original 99 items, the data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. No further comparisons were possible.

Seventeenth Item Set - Description: WPPSI Information.--The Information test from the WPPSI consists of 23 items intended to be arranged from easiest to most difficult. The test includes items such as:

1. Show me your nose. Touch it.
12. What do you need to put two pieces of wood together?
23. Where does the sun set?

These items are intended to tap the subject's general range of information. All of the items seem to require the type of knowledge that an average individual with average opportunities might be able to acquire for himself. Specialized and academic knowledge is avoided but the effects of formal schooling may be influential. Knowledge of this type does seem to presuppose normal opportunity to receive verbal information and, as such, this would appear to be a poor test for people from deprived experiential backgrounds or people with a foreign language handicap.

Seventeenth Item Set - Findings.--The scaling analysis of the 23 items showed a reliability for the disadvantaged sample of .846 with 95 percent confidence limits of .863 and .828. The reliability of these items for the advantaged sample was .785 with 95 percent confidence limits of .806 and .762. The number of items meeting the model fit criterion was 15 for disadvantaged and 13 for advantaged children. Of these items, 10 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 23.42) in favor of the advantaged group.

The 10 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .751 with 95 percent confidence limits of .779 and .721. The reliability of these items for the advantaged group sample was .653, with 95 percent confidence limits of .689 and .614. Adjusted to a base of 50 items, these reliabilities were, respectively, .938 with 95 percent confidence intervals of .945 and .931; and .904 with 95 percent confidence intervals of .914 and .894.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 20.79) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the advantaged group was less than .70, namely, .614, the items were not analyzed by combining the two groups into one.

The 15 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .799 with 95 percent confidence limits of .821 and .776. The item difficulty indices showed a range from 1 percent to 95 percent with a median value of approximately 53 percent. Adjusted to a 50 item base the reliability was .930 with 95 percent confidence limits of .937 and .922.

Seventeenth Item Set - Conclusions.--The reliability estimate for the common items for the advantaged group was too small to justify use of the items in a common analysis.

The 15 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .776. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were good.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 23 items or upon the means of the 10 items that fit the scaling model for both groups.

Eighteenth Item Set - Description: WPPSI Vocabulary.--The WPPSI Vocabulary test consists of a list of 22 words arranged in order of difficulty from easiest to most difficult. Examples of this range of difficulty are as follows:

1. Shoe
11. Castle
22. Gamble

This test calls for the definition of words. In general, any recognized meaning of the word is acceptable, disregarding elegance of expression. Poverty of content is penalized, however. Thus, the results are necessarily influenced by the subject's cultural and educational background. Since each word is read to the subject the effects of reading difficulties should be minimized.

Eighteenth Item Set - Findings.--The scaling analysis of the 22 items showed a reliability for the disadvantaged sample of .803 with 95 percent confidence limits of .824 and .781. The reliability of these items for the advantaged sample was .779 with 95 percent confidence limits of .801 and .756. The number of items meeting the model fit criterion was 18 for disadvantaged and 16 for advantaged children. Of these items, 13 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 30.87$) in favor of the advantaged group.

The 13 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .662 with 95 percent confidence limits of .699 and .623. The reliability of these items for the advantaged group sample was .620, with 95 percent confidence limits of .659 and .579. Adjusted to a base of 50 items, these reliabilities were, respectively, .883 with 95 percent confidence intervals of .895 and .870; and .863 with 95 percent confidence intervals of .876 and .848.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 26.21$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for both groups was less than .70, namely, .623 and .579, respectively, the items were not analyzed by combining the two groups into one.

The 18 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .764 with 95 percent confidence limits of .790 and .737. The item difficulty indices showed a range from 2 percent to 98 percent with a median value of approximately 22 percent. Adjusted to a 50 item base the reliability was .900 with 95 percent confidence limits of .911 and .889.

Eighteenth Item Set - Conclusions.--The reliability estimates for the common items for both the advantaged and the disadvantaged groups were too small to justify use of the items in a common analysis.

The 18 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .737. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the difficult end of the range.

Nineteenth Item Set - Description: WPPSI Arithmetic.--The WPPSI Arithmetic test consists of 20 items arranged in order of difficulty from easiest to hardest. Examples illustrating this range are as follows:

1. (Consists of a large card with three different size balls on it - child must point to largest.)

10. Harry had 2 pennies and his daddy gave him 1 more. How many did he have altogether?

20. James had 8 marbles and he bought 6 more. How many marbles did he have?

The first four items of the test use cards printed with pictures of various objects. These were designed to measure basic quantitative concepts without involving the explicit use of numbers. The remaining sixteen items touch upon commonplace situations and involve simple calculations. While the computational skills required to solve the problems are not beyond those taught in the first grade, the test is obviously heavily influenced by formal schooling, i.e., kindergarten or first grade experience. Each item is read to the child, however, which avoids the need for verbalization on his part and largely eliminates the effects of reading difficulties.

Nineteenth Item Set - Findings. The scaling analysis of the 20 items showed a reliability for the disadvantaged sample of .807 with 95 percent confidence limits of .828 and .785. The reliability of these items for the advantaged sample was .844 with 95 percent confidence limits of .860 and .827. The number of items meeting the model fit criterion was 12 for disadvantaged and 9 for advantaged children. Of these items, 6 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 21.00$) in favor of the advantaged group.

The 6 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .604 with 95 percent confidence limits of .650 and .555. The reliability of these items for the advantaged group sample was -.380, with 95 percent confidence limits that are meaningless. Adjusted to a base of 50 items, the reliability for the disadvantaged group was .927 with 95 percent confidence intervals of .935 and .919. The adjustment was not made for the advantaged group.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 16.22$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for both groups was less than .70, namely, .555 and undetermined, respectively, and since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, -.660, the items were not analyzed by combining the two groups into one.

The 12 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .732 with 95 percent confidence limits of .762 and .701. The item difficulty indices showed a range from 1 percent to 97 percent with a median value of approximately 53 percent. Adjusted to a 50 item base the reliability was .919 with 95 percent confidence limits of .928 and .910.

Nineteenth Item Set - Conclusions.--The correlation between the 6 pairs of item easiness parameter estimates derived from disadvantaged and advantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Also the reliability estimates for the common items for both the disadvantaged and the advantaged groups were too small to justify use of the items in a common analysis.

The 12 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .701. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were good.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 20 items or upon the means of the 6 items that fit the scaling model for both groups.

Twentieth Item Set - Description: Arthur Adaptation of the Leiter International Performance Scale.--The Arthur Adaptation of the Leiter International Performance Scale is a non-verbal test that requires the subject to place blocks into the stalls of a wooden frame. The correct placement of the blocks requires the subject to examine the pictures, patterns, or colors that are printed on a cardboard strip that is placed on the frame above the stalls. The first item in the test is at a two-year level and requires the subject to match five blocks of different colors with the colored squares printed on the strip and place the blocks into the corresponding stalls of the frame. The items progress in difficulty and include tasks involving block design, picture completion, number discrimination, form-color, form-color-number, genus determination, analogous progression of forms, pattern completion, coding and recognition of age differences. The items used in the present study were those of the year two level through the year seven level.

The tasks that these items represent are omnibus in character, much like the items of the Stanford-Binet and other similar tests that are varied in content and concept. Some cultural bias may be present in the items that include pictures of persons and objects, but most of the items deal with colors, shapes and forms and patterns.

Twentieth Item Set - Findings.--The scaling analysis of the 27 items showed a reliability for the disadvantaged sample of .804 with 95 percent confidence limits of .846 and .757. The reliability of these items for the advantaged sample was .740 with 95 percent confidence limits of .805 and .665. The number of items meeting the model fit criterion was 17 for disadvantaged and 10 for advantaged children. Of these items, 10 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 10.98$) in favor of the advantaged group.

The 10 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .759 with 95 percent confidence limits of .814 and .695. The reliability of these items for the advantaged group sample was .611, with 95 percent confidence limits of .732 and .463. Adjusted to a base of 50 items, these reliabilities were, respectively, .940 with 95 percent confidence intervals of .954 and .925; and .887 with 95 percent confidence intervals of .921 and .847.

A comparison of the raw score means of the two groups based on the items showed high statistical significance ($z = 10.49$) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for both groups was less than .70, namely, .695 and .463, respectively, and since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, .649, the items were not analyzed by combining the two groups into one.

The 17 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .779 with 95 percent confidence limits of .828 and .723. The item difficulty indices showed a range from 9 percent to 99 percent with a median value of approximately 86 percent. Adjusted to a 50 item base the reliability was .912 with 95 percent confidence limits of .931 and .890.

Twentieth Item Set - Conclusions.--The correlation between the 10 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Also the reliability estimates for the common items for both the advantaged and the disadvantaged groups were too small to justify use of the items in a common analysis.

The 17 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .723. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the easy end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 27 items or upon the means of the 10 items that fit the scaling model for both groups.

Twenty-First Item Set - Description: Merrill-Palmer Scale of Mental Tests.--The Merrill-Palmer Scale of Mental Tests consists of items that are both verbal and non-verbal. The verbal items include simple questions--"What does a doggie say?" "What is your name?"--action agents--"What sleeps?" "What scratches?"--and repetition of words. The non-verbal items include obeying simple commands, standing on one foot, cutting with scissors, copying a star, form boards and picture puzzles as well as boards.

For the purposes of analysis the items of the Merrill-Palmer were grouped into three sets. The item set under consideration here was labeled "information" and consisted of the following items: the simple questions, the action agents and the identification of one's self in a mirror. There were thirty-one such items.

Twenty-First Item Set - Findings.--The scaling analysis of the 31 items showed a reliability for the disadvantaged sample of .822 with 95 percent confidence limits of .859 and .781. The reliability of these items for the advantaged sample was .617 with 95 percent confidence limits of .700 and .524. The number of items meeting the model fit criterion was 22 for disadvantaged and 10 for advantaged children. Of these items, none were judged to fit the model for both groups; and, hence, no common analysis was possible.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 15.88$) in favor of the advantaged group.

The 22 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .804 with 95 percent confidence limits of .845

and .758. The item difficulty indices showed a range from 21 percent to 99 percent with a median value of approximately 89 percent. Adjusted to a 50 item base the reliability was .903 with 95 percent confidence limits of .923 and .881.

Twenty-First Item Set - Conclusions.--No common analysis was possible for the two groups.

The 22 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .758. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the easy end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true when the comparison is based upon the means of the original 31 items.

Twenty-Second Item Set - Description: Oseretsky Tests of Motor Proficiency.--The Oseretsky Tests of Motor Proficiency were designed for use with children from four to sixteen years of age. In the present study the items from the four-year through the seven-year level were utilized. Each year level consists of six items, each item representing a different type of motor proficiency. The items of the five-year level and the type each represents are: stand in upright position on tip-toe with eyes open for ten seconds (static coordination); hop on one foot for a distance of six feet with eyes open (dynamic coordination); form a small by rolling up a small square of thin paper with the fingers of one hand (dynamic coordination of the hands);

roll a thread on a spool in a specified time (motor speed); put matchsticks into a box using both hands (simultaneous voluntary movements); and clench teeth and show them by parting the lips (associated involuntary movements, i.e., ability to perform without superfluous movements).

Twenty-Second Item Set - Findings.--The scaling analysis of the 25 items showed a reliability for the disadvantaged sample of .773 with 95 percent confidence limits of .820 and .720. The reliability of these items for the advantaged sample was .743 with 95 percent confidence limits of .794 and .686. The number of items meeting the model fit criterion was 19 for disadvantaged and 18 for advantaged children. Of these items, 14 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed no statistical significance (z = .46).

The 14 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .630 with 95 percent confidence limits of .710 and .540. The reliability of these items for the advantaged group sample was .613 with 95 percent confidence limits of .692 and .524. Adjusted to a base of 50 items, these reliabilities were, respectively, .859 with 95 percent confidence intervals of .889 and .825; and .850 with 95 percent confidence intervals of .880 and .816.

A comparison of the raw score means of the two groups based on the items showed no statistical significance (z = .80).

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for both groups was less than .70, namely, .540 and .524 respectively, and since the lower limit of the 95 percent confidence interval of the easiness parameter correlation was less than .80, namely, .616, the items were not analyzed by combining the two groups into one.

The 19 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .763 with 95 percent confidence limits of .813 and .707. The item difficulty indices showed a range from 9 percent to 98 percent with a median value of approximately 82 percent. Adjusted to a 50 item base the reliability was .894 with 95 percent confidence limits of .916 and .870.

<ins>Twenty-Second Item Set - Conclusions</ins>.--The correlation between the 14 pairs of item easiness parameter estimates derived from advantaged and disadvantaged children was small enough to cast doubt on the contention that the two populations develop in the same order the competencies measured by these items. Also the reliability estimates for the common items for both the advantaged and the disadvantaged groups were too small to justify use of the items in a common analysis.

The 19 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .707. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range of the item difficulties was good, but the distribution tended to the easy end of the range.

Twenty-Third Item Set - Description: Peabody Picture Vocabulary Test.--The Peabody Picture Vocabulary Test consists of 150 plates, each of which presents four pictures. The subject responds to each plate by pointing to the picture that he thinks represents the word that the examiner has pronounced. Some of the words in the test label objects, some label actions and some label concepts. The items are arranged in increasing order of difficulty, and the first eighty items were used in the present study. The vocabulary words, from easy to difficult, are represented by the following: table, climbing, snake, temperature, locomotive and autumn.

Twenty-Third Item Set - Findings.--The scaling analysis of the 80 items showed a reliability for the disadvantaged sample of .881 with 95 percent confidence limits of .906 and .853. The reliability of these items for the advantaged sample was .782 with 95 percent confidence limits of .825 and .734. The number of items meeting the model fit criterion was 49 for disadvantaged and 54 for advantaged children. Of these items, 35 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance ($z = 12.79$) in favor of the advantaged group.

The 35 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .801 with 95 percent confidence limits of .842 and .755. The reliability of these items for the advantaged group sample was .722, with 95 percent confidence limits of .777 and .660. Adjusted to a base of 50 items, these reliabilities were, respectively, .852 with 95 percent confidence intervals of .883 and .817; and .788 with 95 percent confidence intervals of .830 and .740.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 13.11) in favor of the advantaged group.

Since the lower limit of the 95 percent confidence interval of the reliability coefficient for the advantaged group was less than .70, namely, .660, the items were not analyzed by combining the two groups into one.

The 49 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .835 with 95 percent confidence limits of .869 and .797. The item difficulty indices showed a range from 9 percent to 99 percent with a median value of approximately 66 percent. Adjusted to a 50 item base, the reliability was .838 with 95 percent confidence limits of .871 and .800.

Twenty-Third Item Set - Conclusions.--The reliability estimate for the common items for the advantaged group was too small to justify use of the items in a common analysis.

The 49 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .797. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The range and distribution of the item difficulties were good.

The data indicate that the advantaged children outperform those of the disadvantaged group to a very great extent. This fact is true whether the comparison is based upon the means of the original 80 items or upon the means of the 35 items that fit the scaling model for both groups.

Twenty-Fourth Item Set - Description: Let's Look at First Graders (Shapes and Forms).--A set of instructional materials was developed in 1965 for the Board of Education of the City of New York. Included in these materials was a series of pseudo-tests that were to be used instructionally. These materials encompassed spatial relations, shapes and forms, communication skills, time concepts arithmetic, and reasoning, each of these categories comprising six exercises arranged in increasing order of difficulty. For the purpose of the present study, instructions were written so that these materials could be given as tests and the several different exercises were dispersed through the four batteries of items that were administered to the subjects in the study. The particular item set under consideration at this point consisted of exercise numbers one, three and five in the shapes and forms category. The items in the first exercise presented the subject with a shape or form such as a triangle and required him to select from three alternatives a form of the same type, but smaller size, that might or might not be inverted or rotated. The items of the fifth exercise consisted of the same general type of task, but the subject was required to make more sophisticated discriminations that might include shading as well as form. The items of exercise three were of moderate difficulty. None of these items, however, was very complex.

Twenty-Fourth Item Set - Findings.--The scaling analysis of the 26 items showed a reliability for the disadvantaged sample of .833 with 95 percent confidence limits of .873 and .788. The reliability of these items for the advantaged sample was .506 with 95 percent confidence limits of .605 and .395. The number of items meeting the model fit criterion was 19 for disadvantaged and 13 for advantaged children. Of these items 9 were judged to fit the model for both groups.

A comparison of the raw score means of the two groups based on all items showed high statistical significance (z = 4.10) in favor of the advantaged group.

The 9 commonly fitting items were analyzed separately for the two groups, and showed a reliability for the disadvantaged group sample of .557 with 95 percent confidence limits of .703 and .374. The reliability of these items for the advantaged group sample was -.268, with 95 percent confidence limits meaninglessly low. Adjusted to a base of 50 items, the reliability for the disadvantaged group was .875 with 95 percent confidence intervals of .915 and .827. The reliability for the advantaged group was not adjusted.

A comparison of the raw score means of the two groups based on the items showed high statistical significance (z = 4.68) in favor of the advantaged group.

The reliabilities were too small to justify a combined analysis.

The 19 items which met the model fit criterion at the first scaling analysis for the disadvantaged sample were reanalyzed and showed a reliability of .785 with 95 percent confidence limits of .844 and .715. The item difficulty indices showed a range from 39 percent to 99 percent with a median value of approximately 87 percent. Adjusted to a 50 item base the reliability was .906 with 95 percent confidence limits of .931 and .876.

Twenty-Fourth Item Set - Conclusions.--The reliability estimates for the common items for both the disadvantaged and the advantaged groups were too small to justify use of the items in a common analysis.

The 19 items that met the model fit criterion for the disadvantaged group at the first analysis were reanalyzed for that group only and produced a reliability coefficient with a lower 95 percent confidence limit of .715. Because this coefficient was greater than .70, interval scale conversions were made for the disadvantaged group. The distribution of the item difficulties tended to the easy end of the range.

The data indicate that the advantaged children outperform those of the disadvantaged group to a significant extent. This fact is true whether the comparison is based upon the means of the original 26 items or upon the means of the 9 items that fit the scaling model for both groups.

PART VI

CONCLUSIONS AND IMPLICATIONS

The purpose of the investigation was to identify scales which would be descriptive of the development of problem-solving skills in young children. These scales were sought in answer to the following question: Do children of different backgrounds exhibit similarities in the order of development and levels of achievement of problem-solving behaviors? Collection and analysis of the data have led the present investigators to reach several conclusions concerning the answer to this question as well as several conclusions concerning the research methods necessary in this type of investigation. These conclusions with some of their implications follow.

The first, and perhaps most significant, conclusion reached in the investigation is that there are problem-solving skills that develop in the same order among children of extremely different backgrounds. The nine sets of items which were found to scale in the same way for both advantaged and disadvantaged children are empirical evidence of this phenomenon. Of course, it is necessary to immediately qualify the conclusion on the basis of the characteristics of the sample. Only children four through six years old were tested. There seems little reason, however, to suspect that the generalization would not hold for younger and older children. Next, only advantaged and disadvantaged children were included. The investigators selected these two groups in order to maximize differences in children. By choosing children of such different socio-economic classes, it was expected that extremes in opportunities to learn and in levels of achievement would be obtained. (The fact that the advantaged children performed significantly better than the disadvantaged children on each of the nine item sets is evidence of considerable differences in levels of achievement.) If item sets could be found that scaled in the same way for such different groups, the present investigators argued, then it would be reasonable to hypothesize that the scales were "universal." Naturally it will be necessary to test this hypothesis through the validation of the nine item sets with other groups of children.

Now what are the immediate implications of the fact that nine scales have been identified that reflect a common ordering of problem-solving skills in children of quite different backgrounds? Apparently, there is sufficient commonality of developmental sequencing to make possible a certain amount of "culture constant" assessment of young children in the nation. Although some caution must be exercised in interpreting these scales as representing developmental patterns along discrete underlying continua (many items which did not scale for the two groups appeared logically to be very much like items that did scale for the two groups), the common scales would seem to have immediate implications for mental measurement, educational programs for young children, and perhaps even theory construction.

With respect to mental measurement, the nine sets of items obviously constitute an excellent starting point for the construction of instruments which can be used across sub-populations of the country. Aside from the fact that these item sets might be used in their present form (after validation, of course, and with the special instructions developed for each, e.g., "Maximum Performance Testing"), they certainly would provide researchers with the kinds of tasks which might be expected to develop in some common order among children. The reader should be reminded that these item sets met specified reliability criteria and produced measurements of interval scale quality.

As to the development of educational programs for young children, the nine common scales can serve as guides for the sequencing of curricula. Although certainly not comprehensive in any sense at the present stage of the research, these item sets can provide curriculum planners with what might be important insights into the order in which children develop various skills. A salient point here is that the sequencing was the same for both groups on these item sets but the advantaged children (as a group) were always further along the scale. In other words, the disadvantaged children learn the same things as the advantaged children and in the same order; they simply take longer to do it. Here the problem is not whether to require disadvantaged children to learn the same things as advantaged children or to teach a middle class culture to lower class children. The point is that both groups develop these skills and the difference is in the distance that they have moved along the scale. Therefore the problem for curriculum planners is how to accelerate disadvantaged children along these continua. The reader will recognize that these scales are related to instructional goals, not to the methodologies by which these goals might be achieved.

A note concerning the relationship of the conclusion to theory is required. In the first place, it must be made clear that the present investigators do not contend that the nine scales necessarily represent true developmental sequencing. They do contend, however, that these item sets reflect readiness patterns to the extent that they scale in the same way across subpopulations or subcultures. Presumably each item is only a sample of a category of items that reflect a position on a continuum. Further research is needed to define these more exactly. Thus, the theorist must take care that he understands what these scales represent before applying them to theory validation or modification.

In addition, it must be pointed out that the research reported here was not designed in the framework of a theory nor to test hypotheses emanating from a theory. In Part III an inductive research context was presented but this amounted to little more than a general view of readiness based on assumptions to be tested in the investigation. Therefore, the contention that the scales generated are consistent or inconsistent with some theory or theories must be made most tentatively.

A second conclusion reached in the investigation is that there are particular problem-solving skills that develop in a particular order for disadvantaged children which are different from the development of these skills in advantaged children. Fifteen item sets were generated in the study which were ordered for disadvantaged children but not ordered in the same way for advantaged children, considering the reliability criteria. While it is true that the advantaged children outperformed the disadvantaged children on all but one of the fifteen item sets (the Oseretsky, consisting of motor performance items), the items did not scale in the same way.

Perhaps the most immediately useful implication of the finding is in the field of testing disadvantaged children. Given the unique form of testing employed and the scaling technique used to construct interval scales, it is possible that the achievement of disadvantaged children can be much more adequately determined. Apparently educators and researchers may be attempting to measure problem-solving status and growth with instruments that do not take into consideration those developmental patterns unique to disadvantaged children. In some contrast to the "culture constant" testing mentioned above, it seems likely that tests can be developed that are "culture biased" in order to determine more sensitively the progress of children in certain subpopulations.

In the area of curriculum development, the identification of the fifteen scales unique to the disadvantaged child is more speculative with respect to implications. Comparisons of the two groups' performance on items that do not scale commonly might be useful in identifying areas in which disadvantaged students require particular instruction. Of course this approach would be based on the fact that advantaged children are more successful in school than disadvantaged children and on the assumption that the present expectations of schools are appropriate for all children. This becomes a philosophical consideration immediately which must be resolved by the society and not by research findings. Nevertheless, the study of empirically-derived scales revealing differences in levels of achievement between the advantaged and the disadvantaged child and in the order in which problem-solving skills develop must lead to significant insights into curriculum improvement.

A third conclusion forced by the data is that many item sets did not scale with sufficient reliability for the disadvantaged children after the scaling analysis had eliminated items that did not meet the model fit criteria. In the case of thirty-two item sets, the reliability lower limits were only sufficient when each item set was adjusted to a fifty item base. Seven other sets were not sufficiently reliable even when the projected adjustment was made. Eight more item sets contained too few items after scaling to allow any further analysis.

The implications of these item sets failing to meet the established criteria for further study lack definitiveness; nevertheless, a study of the data does yield a suggestion. In the first place, the item sets must be viewed as insufficient in the present context to indicate useful sequencing or achievement levels of either the combined groups or the disadvantaged group alone. On the other hand, the easiness parameter intercorrelations of some item sets indicate that both groups may be following a common general sequence of skill development but that the reliability associated with the scores is not of the quality required. If this is true, these item sets, particularly those in the third grouping which did have sufficient reliability estimates for the disadvantaged group when projected to a fifty-item base (thirty-two sets), also may be a fruitful starting place for the development of new instruments.

In Part III of the present report, the existence of readiness behaviors was defined as being units of behavior that were learned or performed by individuals prior to other units of behavior. Further, it was suggested that these behaviors were sequenced in particular ways for one of at least three reasons; the ordering was inherent in the organism, the order was inherent in the skills themselves, or the order represented the sequencing of experiences within the culture. The latter, of course, means simply that the society generally provides the child with the opportunities to learn one unit of behavior before another so consistently that the sequences are definite and discernible.

As one looks at the groupings of the item sets, he sees some that scale for both groups of children, some that scale reliably for the disadvantaged only and some that do not scale for the disadvantaged in a reliable way. Is there some general conclusion to be drawn from the differences in scaling parameters and reliability estimates for the five groups of item sets? Any such conclusion must be tentative indeed. Nevertheless, inspection of the data does seem to suggest that all tests of problem-solving abilities must be to some extent experience-specific. That is to say that the tests must be based to a lesser or greater degree on the specific experiences of the children for which it was designed. As tests are based more and more on experiences that are common to all children, the probability that the tests will tend to scale similarly across subpopulations increases. As particular item sets are based more on experiences unique to certain groups of children, the less effective they may be for use with other groups of children who have not had such experiences. Thus, there is evidence of sequences of development that are based on the ordering of society's experiences for children. It seems particularly important in measuring patterns of problem-solving development to consider the probability that the commonality of experiences of the children involved is a critical factor. The idea that children from one sort of background will not do as well on certain problems as children from a background in which experiences related to the problems have been encountered is not new. This idea is certainly supported by the data. But another and more important idea is also suggested and that is that the ordering of such skills may be different also, whatever the achievement levels of the two groups.

Concerning the methodology employed in the study, several conclusions may be drawn. First, there are a number of reasons related to the research methods that could account for an item set failing to be reliable or to sequence similarly for the two subpopulations. These include the following: measurement error associated with the respondents' guessing answers; possible differential effects of the "Maximum Performance Testing" approach on the two subpopulations; the difficulty characteristics of the items in a particular set (too hard, too easy); lack of stability of the item parameter estimates resulting from limited samples; and lack of differentiating ability of the item set because too few items remained after scaling.

As to the testing procedures used ("Maximum Performance Testing"), these appear to be a tenable method for testing problem-solving skills in young children. Scales were generated from the data obtained and communication difficulties between tester and subject appeared to be minimal. Presumably this form of testing could be used also to test for the mastery of various skills in situations other than sequencing problem-solving behaviors.

The scaling techniques employed in the investigation seem to have potential for the identification of developmental sequences and perhaps in the eventual construction of developmental networks. Twenty-four scales with sufficient reliability were identified. This is indicative of the fact that the procedures were operating in a reasonable and expected manner. There are, however, refinements needed. Some of these are suggested in the following section under recommendations.

PART VII

RECOMMENDATIONS

As stated earlier, the investigation reported in the present document is only a first step in the identification of a readiness network reflecting developmental patterns of problem-solving behavior. Although there are immediate gains to be derived from the study, its chief contribution must be the providing of a basis for further study in the area of mental development in young children. Many recommendations might be made concerning studies that would extend the present work and concerning the improvement of the research tools employed in the study. The present investigators, however, have limited themselves to those recommendations which seem most cogent; these are enumerated below.

1. The twenty-four scales generated in the present study should be validated with new samples. In the case of the nine item sets that scaled commonly for both groups, this validation should include divergent groups or subpopulations. In the case of the fifteen item sets that scaled for the disadvantaged children only, the validation would be with other groups of disadvantaged children.

2. In collecting validation data or in extending the study into other areas, items used in the present investigation should be screened and those which did not yield information (too easy or too hard) should be eliminated or the age of the sample children

should be modified so that the items would be more effective.

3. Further studies of this type should include larger samples and fewer items should be administered to a particular sample. In addition to increasing stability of the item parameter estimates, this would allow factorial procedures to precede the scaling analysis. This would provide for the simultaneous analysis of items from different tests and make possible the examination of the unifactor structure of an item set.

4. The selection of items to be used in a set could be based on two criteria: (a) a logical consideration of what variable the underlying continuum represents and hence the combining of items from more than one of the current item sets and (b) an examination of the scaling data and the inclusion of only items which individually met the model fit criteria in the current analysis.

5. More work is needed in determining the appropriateness of the scaling model and the statistical properties of the methods used in the present study. One aspect of this task would be the comparison of results for one parameter and two parameter solutions.

6. When at all possible in this type of research, items should be used in a format which minimizes guessing. Otherwise a three parameter model may be necessary for accurate description of the data. In the three parameter situation, computations become much more difficult.

7. There is a need to characterize the tasks. In other words it is necessary to generalize if possible the items at all points on a scale to item types. A sequential testing approach could be

built around pools of items of each task type. These procedures would lead to a different definition of reliability, i.e., consistency of the estimates of a subject's ability where additional items are given which maximize the information about a subject's ability. The work done in the present study should be particularly useful to investigators attempting to develop such testing models.

8. The item sets generated in the present study which scale commonly for both groups and those that scale for the disadvantaged only should be used to determine if they are more effective in detecting changes which may result from various intervention programs.

9. Using the data collected in the present study, additional analyses might be made upon different groupings of the subjects tested, e.g., sex, age, geographic region.

10. Further work should be done in identifying common and unique problem-solving scales with younger children and older children than were used in the present study.

11. Logical and analytical procedures for relating scales into networks should be developed.

12. If the twenty-four scales presented in the present document are validated, the implications of them for curriculum development should be explored.

Appendix A

Item Classification Outline

ITEM CLASSIFICATION

OUTLINE

I. PERFORMANCE - Ideally includes items that require motor skill and that are scored for motor coordination or level of physical maturity only.

   1. Action Items - examples: jump! stand with your toes pointed out. - also includes items that require following directions - ex: put the pencil on the chair.
   2. Block Building - Ex: the child is asked to build a pyramid and has a model to go by.
   3. Object Assembly - This is not like the subtest object assembly on the Stanford-Binet which would fall under IV - 2 (Spatial, mazes and puzzles) on this classification. Object assembly here refers to stringing beads and other similar items that emphasize manual dexterity. (ex: pegboards)
   4. Taxonomies - sorting tasks

II. A. Verbal - includes items that require the child to speak and exhibit some verbal skill. Yes and No answers would not be included.

   1. Vocabulary
      a) picture identification - items which require the child to attach a name and/or story to a picture.
      b) object identification - requires the child to attach a name to an object.

c) definition or word meaning - requires the child to verbally define a word.

d) talking - some tests include a very general score. on child's chatter throughout the test.

2. Comprehension

a) analogies - includes items which require the child to supply a missing word. Ex: Summer is hot; winter is ________. Though some of these may be opposites they are included.

b) similarities and differences - items requiring child to explain how things are alike or different. Ex: How are a peach and a ball alike? How are they different?

c) interpretation - includes items that require a child to explain the meaning of a statement, proverb, etc.

d) explanation - requires a child to explain or untangle a sentence or phrase. Ex: What's foolish about this sentence?

3. General Knowledge - Items asking for personal-social information (when is your birthday?) or well known events (what do we celebrate on the 4th of July?) or facts (what is the color of a ruby?)

B. Non-Verbal - This category covers approximately the same areas as II-A (Verbal) but items included here generally do not require the child to speak.

1. Vocabulary
   a) picture identification - items in which the tester gives a word and the child points to or marks the correct picture.
   b) object identification - same as above except the child chooses among objects placed before him.
2. Comprehension - This is a broad category containing items that are intended to evaluate the child's understanding of a situation, picture, object, etc. Although he may be required to give a verbal answer to some of the items, these answers aren't scored for the adequacy of vocabulary but conveyance of some central concept. This category also includes some items referring to time concepts, depending on the form of the item.
   a) picture stories - requires the child to indicate in some way what is happening in a picture.
   b) indicate use for ____________ - includes items which present the child with an object or picture and requires him to indicate in some manner what one does with it. Ex's: Item - a small cup; Response - child pretends to drink. Item - picture of a saw; Response - a sawing motion.
3. Picture, Color or Object Recognition - This, too, is a broad category, including a wide range of items probably requiring a number of skills. First, items

which require the child to find a similarity or difference in pictures or objects; this differs from taxonomical items (also falling in this category) in that it is more complex and requires more than simple grouping. Ex: Item - picture of large ship (find one like this); Response - child chooses among variety of objects a small peculiar boat.

Taxonomies, here, include grouping by color, use, etc. This category also includes mutilated picture items and the child must point out the inconsistency.

4. General Knowledge
    a) Ex: pictures of sun, orange and football - "Take the yellow crayon (tester gives child the correct crayon) and color the one that should be yellow.
    b) pictures of car, bicycle and top - "Mark the one that is most expensive."
5. a) symbol identification - recognition of letters

    Ex: Mark one

    F: S T [✓ F] K

    b) phonetics

    Ex: picture of ball, light and tree - "Mark the picture that starts with the same sound as boat."
6. Sequencing - Items here are mainly picture stories cut into 3 or more stages and child must arrange these in the correct order. Some are reversible. One item

shows a child building a tower if done one way, and taking it down if done another. In this case the child must specify what is happening. Some items that are set up as sequences fall under IV-6, or 7 (Spatial Projection or relationships)

III. NUMERICAL - This category should not include items such as, "How many pennies in a nickel?" which fall under Verbal, General Knowledge, but items which require only a knowledge of numbers and number concepts.

1. a) number - symbol identification - items which require knowledge of printed number symbols (1, 2, 3, etc.)

   b) number identification - (should probably be under counting) - items which demand knowledge of names and numbers. Ex: Tester holds up 3 fingers and asks, "How many is this?"

2. Number Manipulation - direct addition, subtraction, etc. Ex: 2 + 2 is how many? There are few items of this type.

3. Numerical Reasoning - Number problems which require number manipulation. Ex: If one pencil costs 3 cents, how much would two pencils cost?

4. Counting - counting aloud, handing tester a certain number of objects or marking the picture with the correct number of items.

5. Number Concepts - Items which test for the idea of relationships such as more, fewer, half as much, etc.

(some confusing items here - Ex: picture of a whole sandwich, then three pictures of same sandwich (1) cut in half, (2) cut in thirds, (3) cut in fourths. Question - how will this sandwich look when it is cut once?) - Is this a number concept or is it spatial? (These items were classified as number concepts.)

IV. SPATIAL - This category contains many items that are usually grouped under Performance. They are included here when the concepts involve more than physical maturity, muscle coordination or speed.

1. Block Design and Patterning - This is not block building, but arrangement according to some precise pattern where the only guide is a pattern without block division. Items that require the completion of a pattern by choosing a matching piece. Items that require the cutting or folding of paper to match a demonstration model.
2. Mazes and Puzzles - This category includes all mazes - paper and pencil, wood, etc. It also includes puzzles of the jigsaw type, puzzles that have only one missing piece, formboards, or disentangling two fitted pieces (paper-clip type).
3. Taxonomies - classification according to form, size, arrangement, etc. - not usage or color.
4. Copying of Forms - requires child to copy different geometric forms
5. Drawing - includes drawing objects or people without a model. (4) could be included under Performance,

but (5) is relatively independent of drawing skill and focuses on inclusion of detail, with relatively no emphasis on how well the object is drawn.)

6. Projection - requires knowledge of behavior of objects in space. Ex: Jar half filled with colored water standing upright - Task: How will the water look if the jar is tilted (demonstrate with empty jar). The child is given a picture of a tilted jar and asked to draw the water in it.

7. Relationships - items which ask which is farther or nearer to X, with pictures graded in size. Which is larger - smaller? Which mouse is too large to go through this hole?

8. Picture Completion (Closure) - items which require the child to identify or finish drawing an incomplete form or picture.

V. MEMORY

1. Auditory Retention
    a) verbal - includes items which require the child to carry out an extended series of instruction, to repeat a sentence or phrase or to answer questions about a story which he has been read (or to retell the story).
    b) numerical - items which require child to repeat a series of numbers either as they were called out or backward.

2. Visual Retention - items which require the child to repeat words, numbers or letters that he has seen. Items that require the child to draw a form which he has been shown briefly - or items that require the child to imitate an action.

Appendix B

Selection and Organization of Tests

Test Selection and Battery Construction

In order to pursue an extensive investigation of problem solving behavior it was necessary to obtain as wide a selection of problems as possible. The utilization of available instruments was considered the most efficient method of obtaining appropriate cognitive and motor tasks.

All available tests and procedures for measuring cognitive development and psychomotor skills in children from three to seven years of age were obtained and reviewed. Each instrument was judged according to the following criteria:

(a) Relevance of Content: Items had to measure some problem solving ability, either cognitive or motor. Social maturity scales, for example, were considered outside the realm of cognitive development, as were projectives or other instruments designed to measure personality or social emotional variables.

(b) Physical characteristics: Each instrument chosen had to be appropriately designed for the designated age group. Format, picture size, and item characteristics were major determinants for the inclusion of instruments.

(c) Type of Test: As wide a range of testing items as possible was desired, tests which included a variety of items or tests which presented items in an unusual way (e.g., Arthur stencil design) were preferred.

An item classification technique was developed as the tests were reviewed. Each test item was classified according to content and format so that the item classification of a test served as a profile against which other tests could be compared. In this manner twenty-two tests were selected for the study. Some were selected for their wide range of items (e.g., The Binet & WPPSI) some for their unusual format (e.g., the Leiter) and some to test for specific abilities not adequately covered by broad general instruments (e.g., the Frostig).

The design of the study required each child to be tested within a one-month period in order to avoid the contaminating factor of maturity. Other factors, such as fatigue, maintenance of interest and learning as a result of being tested made it necessary that a child not be tested too frequently nor be given too many similar items.

The tests therefore, were organized into four batteries each of which was to be administered to one-fourth of the total sample.

The assignment of the tests into batteries was based on several factors:

(a) Content: Each battery was to have approximately the same content. This was possible only to a limited extent. Wherever feasible each battery contained number items, vocabulary items, spacial relations tasks, etc.

(b) Format: Each Battery was as varied (within itself) as possible, verbal and non-verbal tasks, different item characteristics and types of tests were all taken into consideration. (For the sake of efficient administration the tests themselves could not be broken down in order to assign some items to one battery and some items to one battery and some items to another. This was done only in one case. It was necessary, therefore, that a battery be varied by the tests it included rather than by items from different instruments.)

(c) Testing Time: Tests were assigned to batteries in approximately equal time units, about four hours for each battery.

In order that some basis for relating items across batteries would exist, two tests were designated as "anchor" tests. These were chosen for their wide range of content and different item types. The anchor battery was composed of the Stanford-Binet Intelligence Scale (through year VII) and the Wechsler Pre-School and Primary Scale of Intelligence (WPPSI). The color items from the Caldwell Scale Pre-School Inventory were administered with the WPPSI. The anchor battery was administered to each child in the sample followed by one of the four tests batteries.

Appendix C

Schedule of Research Tests Administered

SCHEDULE OF RESEARCH TESTS ADMINISTERED

Anchor Tests:	Stanford-Binet Intelligence Scale (1960)
	Wechsler Preschool and Primary Scale of Intelligence (1966)
Battery I:	SRA Primary Mental Abilities (1953)
	Preschool Inventory, Caldwell and Soule (1965)
	Frostig Developmental Tests of Visual Perception (1961)
	Columbia Mental Maturity Scale (1959)
	Let's Look at First Graders (adapted for research purposes) (logical reasoning)
Battery II:	Illinois Test of Psycholinguistic Abilities (1961)
	Raven Progressive Matrices for Children (1951)
	Winterhaven Perceptual Forms (1967)
	Let's Look at First Graders (Mathematics)
Battery III:	Minnesota Preschool Scale (1940)
	Merrill Palmer Scale (1931)
	Arthur Point Scale of Performance Tests (1947)
	Arthur Adaptation of Leiter International Performance Scale (1948)
	Let's Look at First Graders (time concepts)
Battery IV:	Metropolitan Readiness Test (1943)
	Culture Free Intelligence Test (1950)
	Peabody Picture Vocabulary (1959)
	Goodenough-Harris Drawing Test (1963)
	Let's Look at First Graders (Spatial relations)
	Oseretsky Tests of Motor Proficiency

Appendix D

Controls for Research Testing
and
Sampling Criteria

Revised - April 23, 1968

CONTROLS FOR RESEARCH TESTING

Specific Procedures	Variables Controlled
1. The number of children tested in each group is to be 100. A substitute pool of 15 will be prepared for each group. Substitutes will be tested only if data on an original S was not obtained, incomplete, or invalid.	1. An N of 100 will provide a sufficient N in each cell of the data matrices.
2. a. Each examiner will be observed at least twice in the field during each calendar month. The day and time of the observations is to be determined by the Tests and Measurement Specialist and not made known to the examiner until the time of observation. The Tests and Measurement Specialist will keep on record at all times a list of qualified observers. An observer must have gone through training sessions on all tests administered in the batteries, be certified by the Tests and Measurement Specialist, and not be one of the active field examiners. The Tests and Measurement Specialist will prepare an observation form to be completed by the observer during the observation period. If any of the items listed under "deficiencies" is marked as occurring, the Tests and Measurement Specialist will schedule a second observation within five days (by a different observer). If the second observer does not concur with the first observer, the examiner will continue in the field.	2. a. Observers familiar with testing requirements will be able to identify inadequacies in testing procedures.

If the second observer concurs with the first observer, the examiner will be suspended from field activity until such time as the Tests and Measurement Specialist certifies in writing that the deficiency noted has been corrected. If an examiner is removed from the field as above, all data collected by said examiner since her last passing observation shall be removed and considered invalid.	
b. Every fourth answer sheet and corresponding Digitek form will be checked by a person and trained for this proofreading function by the Tests and Measurement Specialist. Any errors in scoring or transcription will be noted and the Tests and Measurement Specialist will be informed in writing of these errors. The Tests and Measurement Specialist will then determine the disposition of the data (removed or corrected) and take the necessary steps to insure that the cause of the error is eliminated.	b. This is a check to see if there are any apparent scoring or data transferring errors.
3. Soft toys are to be given (as rewards) to all lower class children at the end of each testing session. Since it is felt that the small toys to be used would not be as meaningful to middle class subjects, they will not be given material rewards. The toys to be used must not be toxic or otherwise dangerous (sharp edges, etc.). The cost will be approximately ten cents per item.	3. These toys or rewards serve a dual purpos of motivating the children for best test performance and for keeping them happy.
4. A person or persons will be appointed by the Field Administrator to supervise children who are waiting to be tested. This may be a teacher or other employee of the school or center where the testing is to take place.	4. This will facilitate good scheduling of children to be tested, prevent unnecessar loss of time, and keep children quiet, happy, and occupied.

CONTROLS FOR RESEARCH TESTING--Continued

5.	Only one child is to be tested in a room at a time, whenever and wherever such conditions are permissible. No testing room shall be acceptable if it does not meet the following criteria: (a) adequate lighting, (b) free from external distractions, (c) pleasant in appearance, clean and free of trash, (d) contains at least 70 square feet of floor space, (e) adequate ventilation and temperature. When necessary a room may be partitioned off for multiple testing. Each section of a partitioned room must also meet the criteria stated above. If multiple testing in a room is necessary, permission must be obtained from the Tests and Measurement Specialist prior to testing.	5.	This arrangement insures better rapport between the examiner and the subject. It decreases the possibility of distractions which limit the validity and reliability of data.
6.	The Stanford-Binet, the WPPSI, and the Caldwell color items (items 79-85, which are administered at the end of the WPPSI items) are designated anchor tests and are to be given to all children in the sample. These tests are to be given in the order listed before all other tests to eliminate the effects of test order.	6.	This procedure establishes or represents a constant or base for all groups of 100 children, making a comparison of the different batteries possible.
7.	Each group of 100 children will receive a different battery (approximately 6 sets of items) after completion of the anchor tests. Each group of 100 will be split into two segments of fifty children. One of the segments will be given the item sets (battery) in the order 1, 2, ..., N; the second segment will be given the tests (battery) in reverse order, i.e., N, ..., 2, 1. This will be scheduled and assurred by the Field Administrator.	7.	This procedure will permit the checking of the effect of the order of test administration.

8. The tests which are administered to a group of 100 are to be as different from each other as possible.	8. This procedure will increase the range of coverage of possible potential factors of ability as well as provide for less practice effect within a battery.
9. a. Each battery will be administered to approximately one-third four-year-olds, one-third five-year-olds, and one-third six-year-olds. The grouping of the sample subjects will be accomplished by 3-month age intervals and where feasible the S's will be spread equally throughout these intervals. No 3-month interval will have less than 8 S's.	9. Such a procedure will permit rank ordering of the items through a developmental age range.
b. An additional sample of 35 3-year-olds will also be tested.	
10. A maximum of five testers can be in a center at one time. The testers are to be spread out in a variety of centers at one time. This condition may be waived on written notification to the Field Administrator by the Tests and Measurement Specialist when conditions are favorable for the placement of more than five testers at a particular location.	10. This procedure will prevent confusion in scheduling the testing of children and interference due to lack of space. It will also reduce disruption of classroom activities.
11. No child is to be tested	11. The procedures will
a. more than three sessions per week. A session begins when a tester first meets the child and ends with the return of the child to his class.	a. reduce fatigue and practice effects.
b. for a session spanning more than 1½ hours, regardless of whether or not a break is taken.	b. reduce fatigue and practice effects.
c. the complete testing on each subject (anchor and battery) must be completed within a 30-day period.	

CONTROLS FOR RESEARCH TESTING--Continued

12. Check for possible difference between Northern middle class private and Northern middle class public. This will be performed by the statistical analyst who will prepare a written report on procedures and results.	12. This will check any error arising from the fact that there are no public school kindergartens in South Carolina. This affects the 5-year-old sub-sample.

Sampling Criteria

Lower Class Southern and Northern:	The children must meet the O.E.O. criteria for the Head Start Program.
Middle Class Northern:	Family income of $8,000 to $22,000 per year.
Middle Class Southern:	Family income of $6,000 to $15,000 per year.

Appendix E

Procedures Used in the Selection and Training of Testers

TESTER SELECTION

The initial complement of testers employed for the summer of 1967 consisted primarily of graduate students majoring in either education or psychology. These persons were screened before employment with particular attention to their educational background, their experience in testing and their experience with young children. They were trained in maximum performance testing under the supervision of a member of the Committee on Educational Research. Each tester was observed in practice situations with children and no testers were allowed to participate in data collection until they were judged competent to administer the tests in this manner. These testers collected data solely within the Southern disadvantaged subpopulation.

In the fall of 1967 other testers were employed on a full-time, permanent basis. All applicants were interviewed by the projects coordinator employed by the Committee on Educational Research. Applicants who met the qualifications and who were deemed to have a high probability of becoming competent testers were referred to the Dean of the School of Education for a final interview. This general format was followed in the selection of all testers other than those employed during the summer of 1967.

In the spring of 1968 testing operations were extended into Pittsburgh, Pennsylvania, the location of the Northern subpopulation samples. At that time the projects coordinator was preparing to accept other employment; he and his successor-elect along with the assistant director of the Head Start Evaluation project visited Pittsburgh to screen applicants for the position of tester. Those applicants selected for employment were then interviewed by the Dean of the School of Education prior to final employment.

Additional testers were interviewed by the assistant project director, the director of research operations (formerly projects coordinator), two members of the tester training staff and the Dean of the School of Education.

Thus, with each successive group of testers, the screening procedures were refined in such a way as to afford maximum exposure of applicants to project officials.

Criteria in addition to the minimum job qualifications included experience with young children, educational background and vocational experience. Furthermore, each tester who was employed was required to possess an automobile and to be willing to travel rather extensively for the purpose of data collection.

TRAINING OF TESTERS

Testers were trained in groups of three to eight throughout the project. After the first summer of testing it was decided that females between twenty and thirty years of age were best suited for testing pre-school children. From experience, it was found that older women found it difficult to establish adequate rapport and had a tendency to "teach" rather than test. Men were sometimes intimidating to young children, particularly deprived children who are unaccustomed to white males except in authoritarian roles such as policemen.

Training for a group of testers required from two to four weeks, depending on the amount of materials to be learned and the size of the group in training. A typical training session began with a half day orientation in which the testers were told about the research project and the part they would be expected to play. Each tester was given all the materials she would need to administer her battery. The testers were expected to learn the tests throughly before children were tested. In order to familiarize themselves with the item, the testers tested each other. An instructor went over each test, item by item, with the testers, explaining what information each item attempted to elicit, the purpose of each item and the type of responses an examiner might expect.

The testers were instructed on the basic differences (in testing situations) between deprived and middle class children, and in so far as possible, how to handle difficult situations such as temper tantrums, withdrawal or hyperactivity. Testers observed demonstrations of the tests being given by experienced testers. Finally, children from local Head Start centers and middle class children from private kindergartens or public schools were used in the training. A meeting was held after each administration so that the instructor could point out errors, answer questions, and discuss children's responses.

When the testers had mastered the materials and achieved satifactory techniques of dealing with children they were observed by one or more staff members from the quality controll staff. Once passed by the quality control staff they were observed for final certification by a clinical psychology diplomate. After a tester received her final certification she was required to practice in the field under "actual" field conditions for one to two weeks before being permitted to gather data for the investigation.

Refresher training was required whenever a tester had not administered a particular test for more than two weeks. Each tester was observed in the field by a member of the quality control staff approximately every two weeks.

Constant observation, refresher training and the elaborate original training were made necessary by the approach to testing which was used. "Maximum Performance Testing" is not a standardized approach. It was imperative, therefore, to make certain the testers maintained consistant techniques in the presentation and probing of each item.

TRAINING PROCEDURES

I. A. Overall introduction to project, what we are trying to do and why, including theory, data analysis and tests involved.

B. Assignment of specific tests to be learned.

II. A. Trainer will go over tests with tester, item by item if necessary.
    B. Tester will give test to trainer or to another tester with trainer present.

III. A. Tester will test child with trainer present.
    B. Tester will test second child with trainer and observer present - tester will be rated by both.

Each tester must reach established performance criteria according to both trainer and observer. A tester will be allowed a third testing session with a child to reach performance criteria, if his rating is not acceptable after this session, he will not be employed as a tester.

RETRAINING OF TESTERS

If a tester needs to be trained on additional tests, the following procedures will be followed.

1. A. Overview of tests to be learned.
    B. Assignment of test materials.
    C. Tester studies materials at home.

II. A. Trainer will go over test with tester, item by item if necessary.
    B. Tester will test child with trainer and observer present - the tester will be rated by both.

A tester will be allowed a second session with a child in order to reach performance criteria.

No tester will go into the field without having met performance criteria according to both the trainer and an observer.

SAMPLE TRAINING SCHEDULE

Training Agenda

Binet/WPPSI/Battery I - Sept. 1 - Sept. 15

Friday, Sept. 1, 1967

9:00 - 12:30

Overall introduction to project.

What we are trying to do and why, including theory, data analysis, and tests involved.

Assignment of specific tests to be learned.

When and how the training sessions are to be conducted. (This includes: a) discussion of tests, b) demonstration of some tests, c) practice among testers, and, d) practice with children.)

Explanation of evaluation procedure for all testing performances.

Distribution of test materials:

a) Check kits for completeness.
b) Binet and Battery I handouts.
c) Testers 1, 2, and 3 will receive Binet and Frostig materials.
d) Testers 4, 5, and 6 will receive Binet and PMA materials.

Meet with Mr. Porter.

Tuesday, Sept. 5, 1967

9:00 - 11:00

Discussion of Binet items - to be gone over item by item if necessary. Answer all questions.

11:00 - 12:30	Demonstration of Binet test.
12:30 - 1:00	Additional questions about Binet.
2:30 - 3:30	Discussion of Frostig and PMA with testers so designated.
3:30 - 4:30	Demonstration of Frostig and PMA.
4:30 - 5:00	Question Period
Wednesday, Sept. 6, 1967	
9:00 - 11:00	Administration of Binet among testers. (3 groups of 2 testers - evaluators watching - each tester is to act as an S and an E.
11:00 - 11:30	Questions and rest break
11:30 - 12:30	Administration among testers of Frostig and PMA.
1:30 - 3:00	Administration of Binet.
3:00 - 4:00	Administration of Frostig.
	Administration of PMA.
4:00 - 5:00	Question period.
Thursday, Sept. 7, 1967	
9:00 - 12:15	Binet testing with children. Each tester giving two tests.
12:15 - 12:30	Question period.
1:30 - 3:00	Binet testing
3:00 - 4:00	Frostig and PMA testing.
4:00 - 4:30	Question period.
Friday, Sept. 8, 1967	
9:00 - 10:30	Binet testing.
10:00 - 11:30	Frostig and PMA testing.
12:30 - 2:00	Distribution of test materials a) Testers 1, 2, and 3 receive WPPSI, Caldwell, and LLFG (X).

b) Testers 4, 5, and 6 receive WPPSI, Columbia Mental Maturity and LLFG (Y).

Monday, Sept. 11, 1967

9:00 - 11:00	Discussion of WPPSI - to be gone over item by item if necessary.
11:00 - 1:00	Demonstration of WPPSI and additional questions.
1:00 - 3:00	Discussion of Caldwell and LLFG(X). Discussion of Columbia and LLFG(Y).
3:00 - 4:00	Demonstration of Caldwell and LLFG(X). Demonstration of Columbia and LLFG(Y).
4:00 - 4:30	Additional questions.

Tuesday, Sept. 12, 1967

9:00 - 11:00	Practice administration of WPPSI among testers.
11:00 - 11:30	Question period.
11:30 - 12:30	Practice administration of Caldwell and LLFG(X). Practice administration of Columbia and LLFG(Y).
1:30 - 3:00	Administration of WPPSI.
3:00 - 4:00	Administration of Caldwell and LLFG(X). Administration of Columbia and LLFG(Y).
4:00 - 5:00	Additional question period.

Wednesday, Sept. 13, 1967

9:00 - 10:30	WPPSI testing.
10:45 - 12:15	WPPSI testing.
12:15 - 12:30	Question period.
1:30 - 3:00	WPPSI testing.

3:00 - 4:00	Caldwell and LLFG(X) testing. Columbia and LLFG(Y) testing.
4:00 - 5:00	Question period.

Thursday, Sept. 14, 1967

9:00 - 10:30	WPPSI testing.
10:30 - 11:30	Caldwell and LLFG(X) testing. Columbia and LLFG(Y) testing.
11:30 - 12:00	Review of testing procedure, including the correct way to complete answer sheets, order tests are to be administered, etc.

Friday, Sept. 15, 1967

9:00	Additional training of testers as needed.

SAMPLE TRAINING SCHEDULE

SCHEDULE FOR TRAINING NEW TESTERS

October 14 - October 25, 1968

LOCATION: ____________________

Monday, October 14	Location - Conference Room
9:00 - 10:00	Organizational Orientation
10:00 - 11:30*	Meeting with Mr. Statler
1:00 - 5:00	Orientation
Tuesday, October 15	Location - Conference Room
9:00 - 12:00*	Orientation
1:00 - 5:00	Distribution and item by item discussion of Metropolitan, LLFG-X, Peabody and Binet.
Wednesday, October 16	
9:00 - 10:00	Discussion and final instructions.
10:00 - 11:00	First Administration of LLFG-X, Met. I and Binet
11:00 - 12:00*	Discussion
1:00 - 1:45	Second Administration of LLFG-X, Met. I
1:00 - 2:15	Second Administration of Binet
1:45 - 2:15	Discussion for Battery IV testers
2:15 - 2:45	Discussion for Binet/WPPSI testers
2:15 - 3:00	First Administration of Met. II/Peabody
2:45 - 4:00	Third Administration of Binet
3:00 - 3:30	Discussion for Battery IV testers
3:30 - 4:00	Second Administration of Met. II/Peabody
4:00 - 5:00	Discussion and distribution of WPPSI and Oseretsky

*At the end of this session, break for lunch.

Schedule for Training New Testers
Oct. 14 - Oct. 25, 1968
Page 2

Thursday, October 17

9:00 - 12:00*	Item by item discussion and inter-tester administration of Oseretsky.
9:00 - 10:00	Fourth Administration of Binet
10:00 - 10:30	Discussion
10:30 - 11:30	Fifth Administration of Binet
11:30 - 12:00*	Discussion
1:00 - 2:00	Sixth Administration of Binet, First Administration of Oseretsky
2:00 - 3:00	Discussion
3:00 - 5:00	Distribution and item by item discussion of WPPSI
3:00 - 4:00	Second Administration of Oseretsky
4:00 - 5:00	Discussion and Distribution of Culture Fair and LLFG-Y

Friday, October 18

9:00 - 10:00	First Administration of WPPSI: Item by item discussion of Culture Fair and LLFG-Y
10·00 - 10:30	Discussion
10:30 - 11:30	Second Administration of WPPSI: Third Administration of Oseretsky
11:30 - 12:30*	Discussion
1:30 - 2:30	Third Administration of WPPSI: First Administration of Culture Fair/LLFG-Y
2:30 - 3:00	Discussion
3:00 - 4:00	Fourth Administration of WPPSI; Second Administration of Culture Fair/LLFG-Y
4:00 - 5:00	Discussion

Appendix F

Instruments used in Routine Evaluation of Testers and Testing Situations with Sample Comments from Quality Control Observers

HEAD START RESEARCH
Summer, 1967
TESTER EVALUATION

Examiner's Name ______________________ Examiner's No. __________
Test being given ______________________
Observer ______________________
Date ______________ Time spent observing (Minutes) __________

Directions: The rater is to place a check at the appropriate position on the continuum, designating in his judgment the examiner's competence.

1. In regard to rapport with the child, does the examiner:

    a. Relates easily with child. (Ideal Tester) ______
    b. Relates well but a better relationship is not impossible. ______
    c. Honest attempt at relationship with child but does not employ appropriate approach. ______
    d. Relates poorly to child (gives test mechanically; is preoccupied with answer sheet, etc.) ______

2. In regard to the examiner's familiarity with materials and procedures he:

    a. Knows the test. Only refers to printed material that is too long or intricate to commit to memory. ______
    b. Needs only minimal reference to notes for proper administration of test. ______
    c. Some lack of familiarity with test materials and their use. (inefficient procedures) ______
    d. Lack of familiarity which has detrimental effect on data. (inappropriate procedures) ______

3. In regard to the degree and appropriateness of probing (questioning procedure) the examiner:

    a. Probes consistently and effectively without cueing response. ______
    b. Attempts to probe at every opportunity but technique restricts effectiveness. ______
    c. Question effectiveness of probing technique. ______
    d. Lack of/or ineffective probing. ______

4. To what extent is the examiner able to detect and alleviate the child's fatigue and/or biological needs?

    a. E immediately recognizes the first signs of needs of S and takes appropriate action. ______
    b. E is alert enough to break up testing period before S becomes distracted. ______
    c. Inappropriate attention to needs. (too seldom or too frequent) ______
    d. E continues to test although S is extremely tired and has overriding biological needs resulting in random or invalid responses. ______

Tester Evaluation
Page 2

5. In your judgment, the data obtained by this examiner are:

   a. Acceptable. __________
   b. Questionable and requires careful review. __________
   c. Unacceptable. __________

Revised Examiner Evaluation Form

Head Start Evaluation and Research Center

Examiner's Name____Examiner's No.____________

Test Observed____Observer_______________

Date______________________________Time spent observing (minutes)___________

Directions: The observer is to place a letter rating (A, B, C, D) in the appropriate blank, designating in his judgment the examiner's competence during the period of observation. Under "Comments," specific references should be made to relevant behavior, positive or negative, as appropriate.

Rating Key:
- A - highly professional competence; near optimal performance for conditions; data valid.
- B - good overall competence, but with specific minor areas needing improvement; satisfactory performance; data valid.
- C - competence only fair; inefficient procedures which jeopardize the validity of the data; this area requires special attention.
- D - insufficient competence; inappropriate procedures which invalidate the data; unacceptable performance.

____1. RAPPORT: Is the relationship established by the examiner conducive to valid responses from the child?
Comments____

____2. MECHANICS: Is the examiner's knowledge of and skill with materials and procedures sufficiently expert?
Comments____

____3. PROBING: Has the child's capacity to respond correctly been maximally probed within the context of the item?
Comments____

____4. REINFORCEMENT: Are the examiner's reactions to the child's responses appropriate to the situation?
Comments____

____5. TEST-ORIENTED NEEDS: Does the examiner demonstrate a sensitivity to the characteristics of the child relevant to the test situation and adapt the administration accordingly?
Comments____

____6. BIOLOGICAL NEEDS: Does the examiner demonstrate a sensitivity to fatigue, boredom, biological needs, etc., and take proper steps to alleviate them quickly?
Comments____

____7. In your judgment are the data obtained by this examiner acceptable? (A - Yes, B - Questionable, C - No)

Committee on Educational Research
Head Start Research
Summer, 1967

COMMENTS MADE DURING OBSERVATION OF TESTERS

1. Asked child - "Want to blow your nose?" - Child said, "Yes." - Waited for 3 more items to take him out.

2. Had child that was consistently getting stories wrong - should have stopped and explained more thoroughly. He gave all the instructions but child just wasn't getting it.

3. "An ocean is deep, a pond is ________." E did not probe enough on this particular item, but rather accepted too quickly a DK answer.

4. On repeating numbers item, E may have given more items than necessary. It was pretty obvious that S could not remember so many numbers. E should have gone on to the next item sooner than he did.

5. The child's name is ______________. This child tried to be a real wiseguy. He would try to pound on the table or go to the window, etc. Only when the E was very firm with the child was the data apparently valid. It appeared to this O that the child had previously been handled too permissively in the past, resulting in his present behavior. This E appeared to take the right approach (firmness) but it may have been too late. This was the last testing situation for this child.

6. Lacked sufficient "at ease" conversation with child - (Encouraged to focus on child and his interests rather than the test.)

7. Probably gave away the fork by touching it while the boy was looking.

8. A little too quick with probing on Leiter. E should always wait until S puts all the blocks in place before readjusting - give S time to make own adjustments.

9. Administers items at too fast a pace.

10. Digit repetition is "2 per sec." - practice these to stop watch.

11. Don't say to child, "Do you want to say these numbers after me?" - rather - "I'm going to say some numbers - when I finish I want you to say them after me" - etc. (The child doesn't actually have a choice here - so why ask - "do you want..." etc.

12. Examiner should probe when child says "tree" when shown picture of a leaf.

13. Feel that E should use notes during "comprehension" section of LLFG. Tended to get story "mixed up," but immediately corrected. Apparently did not invalidate responses.

14. Fill in short intervals with casual conversation. S might relax more.

15. Be sure child has smooth surface on which to work during "mazes."

16. Be absolutely sure child understands directions - if necessary, repeat sample item, explaining it in different words - (stencil design).

17. Pace too fast on Raven.

18. Refers to directions a little too much. In this test E has to read the item instructions exactly, but the lead in can be done a little more spontaneously.

19. Probing on performance items, such as placing one book under another, although difficult, can be done more effectively.

20. E was told that he was pushing too far and that his probing should never change the original item or task.

21. E's manner is slightly stiff and formal. He doesn't appear to want it this way but that is the way it comes out. Probing technique can be improved by re-phrasing questions. E has habit of simply repeating the question, with slight change or no change, and if this is not responded to, repeats his revision without revising further.

22. Get all materials ready before starting test. E had to leave S with observer to go get additional mazes for test - the kit supply was exhausted.

POSITIVE OBSERVATIONS

1. "We'll put your name on here (maze) so we'll know which pretty little girl it belongs to." "Remember, we don't want any shrugging of the shoulders or nodding of the head. Sit up straight and say 'yes' or 'no'." E never leaves child completely but rather keeps a steady conversation at all times to keep child looking at him. Aids attention!

2. E not only knows tests but understands them.

3. Rather shy child - in some cases had to pull answers out. E worded questions differently in some cases, to elicit correct response.

4. Very active child - E was firm when needed to be, e.g., when S wanted to use or play with pencils, but E put them out of reach of S, saying that they weren't needed for these items.

5. Probing excellent - gives S plenty of time to arrange all blocks and make any arrangements. Then E corrects and gives all blocks again.

6. Uses test content as take-off for conversation that really seemed to hold child's attention.

TESTING CONDITIONS

The conditions under which tests were administered to the children in the samples varied widely from situation to situation. In all cases the nature of conditions was reported to the staff of the Committee on Educational Research. In most cases tests were administered in classrooms, conference rooms, or other small rooms available at the testing site. Occasionally, tests were administered in a hallway provided the levels of noise and traffic permitted. In some cases, tests were administered in van trucks equipped with furniture for small children. In other cases, tests were administered in aluminum utility houses especially furnished for the situation.

Particular attention was directed to the size of the room, the general appearance, noise levels, traffic volume, furniture for testing small children, accessibility to children, accessibility to restrooms, and other features which logically influenced the child's reaction to the environment. Although the testing conditions were diverse, in all instances they were deemed to be acceptable with respect to their influence upon the validity of the data collection.

UNIVERSITY OF SOUTH CAROLINA
COMMITTEE ON EDUCATIONAL RESEARCH

REPORT ON TESTING CONDITIONS

Date____________________________

Observer__________________________

Test____________________________

Tester___________________________

CENTER____
Name of Center City State

TESTING SITE

Type of Facility (room, porch, etc.)__________________________

Location (center bldg., adjoining bldg., etc.)______________________

CONDITIONS	Optimal or Good	Fair but Acceptable	Unacceptable
Accessibility to Classroom			
Freedom from noise			
Privacy			
Working space			
Working surface, chairs, etc.			
Lighting			
Ventilation			
Temperature			
Cleanliness			

COMMENTS____

OVERALL RATING OF CONDITIONS

A - Optimal
B - Good
C - Fair but adequate (insignificant deleterious effects on data).
D - Conditions so poor that data are significantly impaired.

10/10/68
ew

Appendix G

Maximum Performance Testing

Probing Rationale and Procedures

Maximum Performance Testing

Charles R. Statler and Nancy Wludyka

University of South Carolina

Paper read to the Southeast Invitational Measurement Conference, Columbia, South Carolina, October 5, 1968.

The Committee on Educational Research, University of South Carolina, is currently conducting research in the area of cognitive development in the age range 3 - 7 years. The purpose of this research is threefold. (1) The construction of a sequential scale of cognitive development - a scale which delimits problem solving abilities and the stages of development within these abilities. (2) The relation of teaching methodology to the sequential scale through the development of curricular hierarchies and (3) The eventual diagnosis and treatment of problems in cognitive learning by means of instructional programs derived from empirical findings.

In order to execute the construction of the developmental profile, the Committee assembled four batteries of tests, each battery consisting of a set of anchor items and a balanced body of items tapping problem-solving abilities. Except for the anchor items each battery was different from every other battery in composition, but very nearly the same in content. That is, each battery contained different items designed to measure perceptual-motor ability, verbal ability, etc. Every child in each population sampled would be administered one complete battery. The population to be sampled represent wide variation in American culture and geography.

For the development of the profile the committee was not interested simply in a child's response to a question or demand but in whether or not a child could successfully perform a task, or solve a problem when he knew what was expected of him and had sufficient time in which to perform. A test item administered with typical standardized manual instructions is obviously insufficient for this purpose. It was decided, therefore, that each test was to be administered in the following fashion:

1) All items in the batteries would be given to every child providing rapport could be maintained and the child kept from distress;

2) All items would be administered with intensive and appropriate probing;

3) No rigid limits would be imposed, neither time limits nor number of trials; and

4) Cut-off criteria would depend upon the tolerance of the individual child.

In order to place items along a reliable continuum of difficulty, item parameter estimates would be required for each item and, therefore, it was necessary that all items within each set be administered to all the children receiving the set. For such a task, the tester must be expert in rapport techniques, relate well with the population under study, and be sensitive to the slightest change in the child's behavior. A child faced with constant failure, as many would be under such a barrage, is easily lost and difficult to recapture. The tester must be able to extract all that the child has to give without demanding so much that the child withdraws from the testing situation.

No item carries definite trial or time limits. The ability to solve a problem does not, for current purposes, incorporate the amount of effort required to solve it. The tester does record, however, the number of trials or the length of time required for a task. Such information is more useful for analysis and diagnosis than that obtained by imposed limits.

In most instances specific cut-off criteria, i.e., conditions requiring termination of testing, are left to the judgment of the tester. This is not an arbitrary decision, however. Testing is terminated for subtests composed of items ordered according to difficulty level only when, in the tester's opinion, further questioning would be definitely detrimental to the testing situation, i.e., loss of rapport or withdrawal of child. If the items are not increasingly difficult, testing is terminated only temporarily, or broken by some pleasurable task by means of which the tester may draw the child back into the test.

Probing is the fundamental element of the maximum performance approach. Without probing there is no assurance that the child has answered the particular question which he was asked, or that he has understood the particular task to be performed. True, these may be indications of ability, but such results are not very helpful in the construction of a developmental profile. Appropriate probing refers to the elicitation of the best response the child is capable of making without losing or altering the intent of the item and without cueing the answer. All probing would be indicated in the test booklet. The child's responses would be recorded verbatim.

Since the content of the probing must differ from child to child, the"standardized" instructions which may be given with each item are limited. Valid results can best be obtained by standardizing the training of the testers. The tester must understand the content of each item and the limits to which he may go in eliciting a response. He should be familiar with the purposes of the testing and the way in which the results are to be used, and he must be well acquainted with the population with which he will be working.

The Committee on Educational Research found the following training program highly effective in producing competent testers:

1. Each tester is instructed in rapport techniques and general problems of the testing situation.

2. An instructor goes over each test item by item with a small group of testers, explaining the content of each item which required pre-determined definitions, the possible responses, the desired response, and the acceptable means of obtaining such a response.

3. The instructor demonstrates the test for a small group of testers on a subject drawn from the population to be tested.

4. Testers administer the tests to each other, friends, relatives, etc., until reliance on the manual is minimal.

5. Testers administer tests to members of the population to be studied. All testing is done with continual supervision. After each testing session, time is reserved for critical evaluation of testing techniques and for questions. This schedule of testing and evaluation of the tester is continued until the tester receives a perfect score

on the rating scale. (See Tester Rating Form in Appendix B.)

Each tester is rated by at least three persons (observers) well acquainted with the tests and experienced in their administration. The observer remains in the room throughout the testing period.

6. The tester goes into the field, or into actual testing conditions, and tests a fraction of the sample set aside for this purpose. Supervision or observation of the tester is reduced but continual. These data are not used in later analyses.

7. The training is completed, but observation periods are continued throughout the testing in order to maintain consistency across testers in probing techniques and to prevent the stabilization of peculiarities testers are prone to develop. Meetings of testers are called at intervals to discuss the results of observations which include evaluations recorded on the rating scale, the administration of individual items, scoring, etc.

Illustrative Items and Probing:

1. Q. What must you do to make water boil?'

   A. Put it on the stove or heat or put fire under it or cook it.

   Intent: The intent of this question (for the purposes described) is to ascertain whether or not the child knows that heat is required in order to boil water. If no response (or unacceptable response) is obtained then probing is required.

   Acceptable probing: in order of progressive failure

   Q. If you had some water and wanted it to boil, what would you do?

   A. N R *

   Q. If I had a pot and put water in it and wanted it to boil, then

---

* No Response

what would I have to do?

Unacceptable probing: anything suggesting heat

Q. What would happen if you put it on the stove?

Q. Must you make it hot? etc.

Acceptable answers: anything suggesting heat

2. Probing with intent to break a set

Q. What is a shoe?[2]

A. Made of cloth, points to shoe. (acceptable)

Q. What is a knife?[3]

A. Made of metal (acceptable)

Q. What is a bicycle?[4]

A. Made of metal (not acceptable, but child has formed a set and feeding further vocabular items into this set would probably result in fallaciously low score).

Probing:

Q. Yes, it is made of metal, but what is it?

A. It's some rubber, too.

Q. That's right, Roy, but what do you do with a bicycle? What's it for? or, Do you have a bicycle at home? What do you do with it?

Probing is designed to break the set of descirbing an item in terms of its components.

3. In Picture Completion tests standard procedures

Permit no variation from the use of the word missing, e.g.,

Q. See this picture. Some important part is missing. Tell me what is missing.[5]

The intent of this subtest is obviously not to measure the child's ability to interpret the word "missing." Though most children catch on quickly, this is sometines a problem. Acceptable probing revolves around wording.

Examples:

Q. See this picture, something is gone, something is not there, tell me what it is.

Q. See this wagon. This wagon needs something. Tell me what this wagon needs.

Unacceptable probing contains cues.

Q. See this wagon. This wagon won't roll right. What does it need to roll?

4. Opposite analogies type items

"Brother is a boy; sister is a -----------."[6]

Acceptable probing

You know what a brother is, don't you? Brother is a boy, and you know what a sister is - Sister is a ----------(child must finish sentence not answer question).

Unacceptable probing

Is sister a boy? Then what is sister? Though this may not change the item appreciably, it is no longer an analogy and therefore is unacceptable.

5. One of the items of the Frostig requires the child to outline a triangle within a square.[7] A large demonstration card provides the tester with a triangle. The tester shows the triangle to the

child saying: "See this shape. It is called a triangle. Look at it carefully. (Tester outlines shape with his finger) See what I'm doing - now, you do it. Put your finger here and go over the lines. Good! Now, let's do it with a crayon. (If the child colors the triangle). No, you filled the triangle with red. We only want to color the lines of the triangle - see, this line and this line and this line. (Selects contrasting color) Now, take this crayon and color the lines of the triangle, just the lines."

Instruction is continued until child performs the task correctly or until rapport is threatened. Since this is a test of visual perception, teaching the item by over instruction is no problem.

On materials which require only a pointed finger or the indication of a choice (e.g., "Show me the one that is different.") probing is used to break sets (such as always pointing to the upper left hand corner) to slow a child down or to explain the task as often as necessary.

Example of over-probing:

Probing too much is just as ineffective as probing too little. When an item is obviously beyond the grasp of a child, repeated probing is useless and harmful.

6. Q. What would you do if you were in a strange city and someone asked you how to find a certain address?[8]

A. I'd buy one.

Q. All right, Sue, listen again, this is a hard one, so listen very closely and see if you can answer it.........Examiner repeats Q.

A. I don't know.

Q. I'm sure you know - if you were in a town you had never been in before and someone asked you how to get somewhere, what would you tell them?

A. Go to town.

Q. Examiner again rephrases question.

When the examiner continues probing on items beyond the child's comprehension, the child may become frustrated and angry or withdraw. Overprobing is a waste of time and places unnecessary strain on both child and tester. Overprobing on one or two items may invalidate test results for an entire test since the child may lose interest in the test and rapport with the tester.

Another pit fall of probing is the tendency it creates in a tester to teach. It is easy to mistake teaching for probing. Appropriate probing never contains cues to the correct answer.

Example of Teaching:

7. Q. How are a coat and a sweater alike?[9]

A. No response.

Q. You know what a coat is. What do you do with a coat?

A. Put on.

Q. Right! You put it on, don't you? Well, what do you do with a sweater?

A. Put on. (response practically guaranteed by previous enthusiastic reinforcement).

Q. Good! So what is that you can do with both a sweater and a coat?

A. Put on.

The final response is one which would be scored correct , but whether or not the child has answered the question is dubious. He may have simply been taught what to say.

The line between probing and overprobing or teaching is fine. It may be drawn only as one understands every item on every test, for it varies from item to item and from test to test, depending upon the type of test, the task to be performed and the wording of the item.

Appendix H

Procedures for Internal Quality Control of Test Data

DATA QUALITY CONTROL

1. At the time a child is chosen for testing and assigned to a Battery, a file folder will be marked with his name, number and battery to be kept in Gene Hendrix's office.

2. Tests will be added to the folder day by day as they come in, at the same time they will be checked off the master list.

3. At the end of each week every fifth folder will be QC'd by the testers under the direction of Bill Brooker. Each QC'd folder will have a QC check sheet taped inside the front cover.

4. On Friday all the completed data of the week will go to Wardlaw to Nancy's office where a second QC check will be made on the folders previously QC'd. If data is in order Nancy will put it in the Wardlaw files. If more than 1% error, data will go back to College Street office to be rescored.

QC PROCESS FOR DATA IN FILES

1. Every fifth folder in the files will be QC'd by the testers in the following order: Southern Lower, Southern Middle, Northern Lower, Northern Middle.

2. If consistent errors are found, T&M must be notified immediately as to the nature and extent of the problem. When troublesome errors are found each file in the series must be checked. A series consists of all tests given in a Battery over a certain period of time (i.e., Battery I, Summer '67).

3. QC'd folders will have sheet attached (inside front) and every 5th QC'd folder will be held out for a second check by Nancy Hendrix or Bill Brooker. Each folder pulled for checking will be marked "QC checked and date" in red on the front cover, upper right hand corner.

Appendix I

The Analysis Procedures

The Analysis Procedures

Selection of the Scaling Model

The model which the present investigators had initially intended to apply for purposes of scaling was the normal ogive scaling model. This model presumes a cumulative normal item characteristic curve relating success probability on an item to the underlying latent trait θ (see Figure 1).

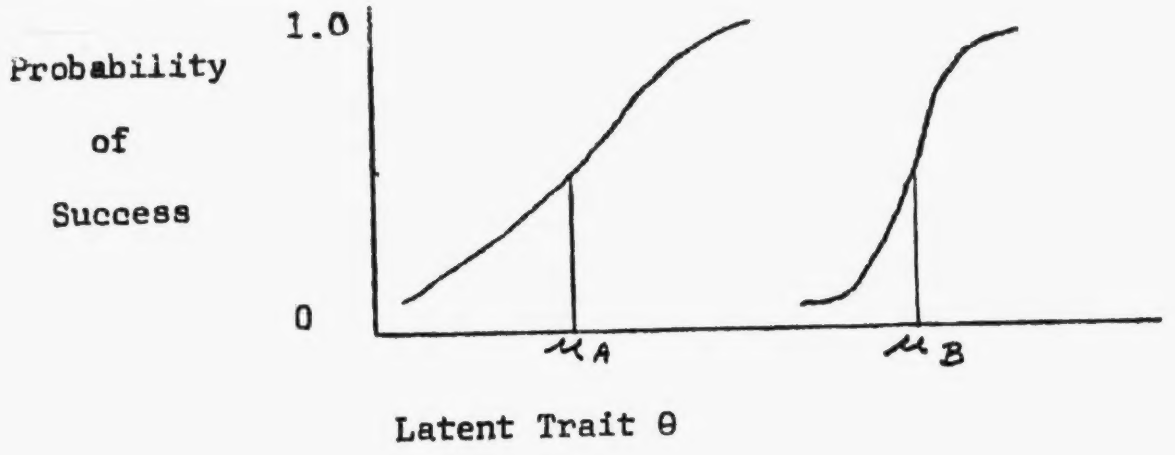

Fig. 1

It can be noted from the above two trace lines that item A is easier than item B (its median difficulty at μ_A is less than μ_B) and that item B discriminates more sharply (the curve is steeper) around μ_B than item A does about μ_A.

A model which is very similar to the normal ogive but which has some properties that are mathematically more tractable is the logistic test model developed extensively by Birnbaum, Lord, and others.[1]

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[1] Lord, F.M. and Novick, Statistical Theories of Mental Test Scores. Addison Wesley, Reading, Mass., 1968.

A third model, initially introduced by Rasch[2], is comparable to the logistic test model with the exception that it requires all test items in the set to have the same discrimination parameter, i.e., all item characteristic curves must have the same slope. A computer program which used this scaling model was obtained from the University of Chicago where it was developed by Wright and his associates. It is described rather completely in "A Procedure For Sample-Free Item Analysis," by Wright and Panchapakesan, Ed and Psych Measurement, 1969, V 21, 23-48.

The Rasch model presumes that the probability that a subject responds correctly to an item is a function of two quantities; a subject ability parameter and an item easiness parameter. The items are initially sorted from easy to difficult on the basis of the proportions of the sample getting them right and at the same time score groups are formed for each possible score from 0 to K if there are K items under consideration. Those subjects with zero scores or perfect scores are then eliminated because they add no new information for the scaling problem.

According to the model, the odds of success on item i for subject n is a product of E_i and Z_n. Initial estimates of quantities related to E_i and Z_n are obtained by an approximate method referred to as the log method. These initial estimates are then used to develop more refined estimates which maximize the likelihood ratio statistic for the sample. This solution is an iterative one.

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[2] Rasch, G. Probabilistic Models for Some Intelligence and Attainment Tests. Copenhagen: Danish Institute for Educational Research, 1960. Chapters V-VII, X.

Among quantities which are output are measures of how well the data fit the model in an overall sense and also how well each item fits the model.

In viewing the purposes of the current research, it appeared reasonable to apply the Rasch model. Some of the reasons for this decision are:

1. The transformed score, if it proved useful, is a function of the total number correct, and tables which can be used by the consumer can be easily produced.
2. It is a fairly simple model and the available program provides information on item fit. Models with more parameters would have made the cost of data analysis prohibitive.
3. There were a large number of items in which a child could guess the correct answer if he were so disposed. Having no preconceptions of which items a child might guess on, there was no basis for eliminating some items and retaining others. It also appeared that eliminating them all would be wasteful. Since items could be eliminated which did not fit the model, it seemed reasonable to believe that guessable items which indeed were guessed would be eliminated by the procedure.
4. Wright and Panchapakesan report concerning equal discrimination and guessing that "the model is quite robust with respect to departures from these assumptions."[3]

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[3] Wright, Benjamin, and Nargis Panchapakesan, "A Procedure for Sample-Free Item Analysis." Educational and Psychological Measurement, 1969, p. 25.

Thus the robustness against departures from constant discrimination, the method of dealing with chance guessing, and the availability of efficient computer programs all entered into the decision to use the Rasch model.

Analysis Procedures

The present investigators viewed the analysis as beginning with sets of items which included scalable sets and additional items which did not fit a unifactor model. They did not submit a set of items to any direct test as regards the factorial complexity of the space they may have tapped. It was the feeling that beginning with a set of items, specified by the publishers to measure a particular trait, would be the best approach. The number of subjects tested for a battery being approximately 350 did not seem to be sufficient to warrant a factor analysis of the total of approximately 400 items which were battery specific. Thus, items which measured factors other than the "dominant" factor in a set would tend to be deleted by the scaling procedure because of lack of fit with the model.

For future purposes, if larger samples were available, a recommendation to use a procedure such as image analysis, which has been shown to work quite well with binary data, would probably be a useful first step.

Initially, subtests or, as in the case of the Binet, arbitrary sets of items were input to the Rasch model program. Among the results output from the Rasch program is an approximate X^2 statistic which, for each item, gives an indication of how it fits the scaling model. This X^2 statistic is accumulated over the various score groups which have more than a minimum prescribed number of subjects. The value of this parameter, the minimum number of subjects, is optional and was selected to be 5 for most of the results presented. Although, this item fit test is based on "large sample theory," Wright and Panchapakesan[4] have suggested that a minimum of 5 subjects per score group may be a reasonable value for this parameter. During this first phase run, items which had a probability value of .10 or less were deleted. The rationale for using this criterion was that since there was a wealth of items, a large Type I error would be appropriate. This level would tend to reduce the probability of a Type II error.

A fairly large probability value is in keeping with some results of Brink[5] in which random data had fairly high chi square probabilities associated with it (.4 on the average). This deletion, it was felt, would eliminate guessable items even though if an item were rewritten it might fit the scale. The point of view was that there were sufficient non-guessable items to fill in most scales at least to some degree. In order to obtain more information on the characteristics of the scaling program, various sets of random data for which no structure was present were analyzed. Samples of size 100 and 400 were used and the number of items was taken to be 10, 20 and 40. The other parameter which was varied was the distribution of item difficulties. Since the subjects' scores were not related, these data do not fit the model. In this situation the percent of items eliminated due to an item probability of fit of less than .10 ranged between 15 and 30 percent for the runs with sample size 400. This would be viewed as disturbing except for the fact that the KR-20 reliability estimates are around zero so that similar real data would be eliminated from use in further scaling attempts. Thus the reliability criterion is seen to be important criterion in this methodology.

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[4] Wright, Benjamin, and Nargis Panchapakesan, "A Procedure for Sample-Free Item Analysis." Educational and Psychological Measurement, 1969, pp. 23-48.

[5] Brink, N.E., "Characteristics of Rasch's Logistic Model." Paper given at Annual Meeting AERA, 1970, Minneapolis.

A somewhat limited attempt was made to determine whether or not the one parameter model was appropriate for the data. This was accomplished by analyzing data for 6 subsets of items from Battery I for the advantaged group using methods described by Indow and Samejima.[6] The item easiness parameters from the two outputs were then correlated. The results are indicated below.

Correlations of Easiness Parameters
for the Advantaged Group
for Seven Item Sets

Substet of Items	No. of Items	r
Cal 1	49	.69
FRO 1	21	.85
VBL 1	24	.84
PER 1	23	.88
NUM 1	13	.99
SPA 1	12	.99
COL 1	41	.57

The results suggest that for some of the item sets a single parameter is reasonable but that for others, a two parameter model may be required.

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[6] Indow, Tarow and Samejima Fumiko, On the Results Obtained by the Absolute Scaling Model and the Lord Model in the Field of Intelligence. Third Report of Psychological Laboratory, Keio University, Hiyoshi, Yokohama, Japan, 1966.

Appendix J

Statistical Data Produced by Analyses of the Item Sets

Statistical Data for Various Item Sets

As indicated in Part V, the statistical data produced by the analyses related to each item set which scaled commonly with sufficient reliability or scaled with sufficient reliability for the disadvantaged group only are included in the present appendix. For each item set the results are presented in six steps followed by a summary of the item analysis for commonly retained items for the two groups combined and/or (as applicable) a summary of the item analysis for items retained for the disadvantaged group only.

In Step 1 the results of the first analysis of the item set are depicted. These are items retained for disadvantaged and advantaged groups and items retained in common for both groups. Step 2 is a comparison of the raw score means for the two groups.

In Step 3 the results of the second analysis are presented. These data are for the advantaged and disadvantaged groups separately for commonly retained items. In Step 4 the raw score means are compared for the two groups.

The results of the third analysis appear in Step 5; in this step, the items commonly retained for the advantaged and the disadvantaged groups combined are analyzed. In Step 6 the results of the fourth analysis appear. These items were retained for disadvantaged children in the first analysis. The reader will recognize that not all of these steps will be appropriate for each item set. The results of one analysis conceivably can eliminate the need for or possibility of another. In these cases, the words, "not applicable" will appear for the analyses or table in question.

FIRST ITEM SET--CALDWELL PRESCHOOL INVENTORY

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
85	67	62	49	.952	.963	.940	.934	.946	.920

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
56.68	71.33	9.82

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
49	.937	.951	.921	.913	.930	.894	.891	.938	.814
50 *	.938	.952	.923	.915	.931	.896			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
31.25	40.44	9.18

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
49	.937	.946	.927
50*	.938	.947	.928

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
110.08	124.56	8.29

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

FIRST ITEM SET--CALDWELL PRESCHOOL INVENTORY

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
389	98.20	3.454	0.24	1.00	Show me your neck.
431	96.70	2.754	0.38	1.00	How many eyes.
401	95.50	2.375	0.24	0.40	Jump.
400	94.89	2.218	0.28	0.03	Face door.
458	94.89	2.218	0.35	0.96	Bigger, tree or flower.
442	94.29	2.076	0.32	0.67	Which more, 2 and 8.
433	91.89	1.610	0.43	0.98	How many hands.
440	91.29	1.512	0.44	0.88	Count to 5.
407	90.69	1.419	0.43	1.00	3 cars in big box.
432	90.69	1.419	0.42	0.97	How many noses.
460	90.69	1.419	0.47	0.78	Heavier, brick or sho.
386	89.79	1.288	0.41	0.39	How old are you.
398	88.59	1.127	0.37	0.10	Hello very loudly.
383	87.69	1.015	0.43	0.88	Color triangle orange.
394	87.39	0.979	0.36	0.26	What call (knee).
399	87.39	0.979	0.43	0.28	Hello very softly.
378	87.09	0.944	0.43	0.52	Identify black crayon.
381	86.79	0.909	0.51	0.31	Color circle yellow.
457	86.19	0.841	0.44	0.95	Bigger, ball or bicycle.
415	83.48	0.560	0.42	0.33	Which way phonograph.
417	82.88	0.502	0.44	0.78	When eat breakfast.
391	80.78	0.308	0.43	0.09	Show me your heel.
429	80.18	0.256	0.41	0.00	What does your father do.
445	80.18	0.256	0.54	0.77	Point to middle one.
452	78.38	0.104	0.49	0.20	Draw a square.
459	77.48	0.030	0.49	0.03	Slower, car or bicycle.
385	76.28	-0.065	0.48	0.58	What is your last name.
~~428~~	~~75.68~~	~~-0.111~~	~~0.50~~	~~0.12~~	~~What does teacher do.~~

FIRST ITEM SET--(Continued)

Summary of Item Analysis for Commonly Retained Items
for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
446	74.77	-0.180	0.62	0.21	Point to first one.
435	72.67	-0.335	0.56	0.56	How many wheels-car.
404	71.17	-0.442	0.49	0.18	Yellow car on little.
380	69.67	-0.546	0.43	0.04	Which crayon color of.
447	67.57	-0.689	0.66	0.56	Point to last one.
441	64.56	-0.887	0.66	0.28	How many corners.
453	63.96	-0.926	0.56	0.10	Draw a triangle.
403	61.86	-1.060	0.53	0.07	Blue car under green.
412	60.96	-1.117	0.44	0.00	Which way does saw.
444	60.36	-1.154	0.47	0.00	Which more, 2 and 8.
414	56.76	-1.378	0.56	0.10	Which way ferris wheel.
448	55.26	-1.471	0.69	0.62	Point to second one.
379	51.05	-1.728	0.56	0.30	Which crayon color of.
449	46.55	-2.004	0.61	0.26	Point to next-to-last.
410	41.74	-2.302	0.56	0.30	Name car that pulls.
418	41.74	-2.302	0.60	0.38	Time of year hottest.
419	41.14	-2.340	0.66	0.51	Time of year coldest.
411	40.24	-2.397	0.55	0.11	Name last car on train.
434	33.63	-2.827	0.63	0.42	How many toes.
420	32.13	-2.929	0.57	0.37	Time of year now.
443	25.83	-3.380	0.52	0.27	Which more, 6 and 6.

SECOND ITEM SET--PRIMARY MENTAL ABILITIES PERCEPTUAL SPEED

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
28	25	25	23	.855	.887	.819	.834	.868	.796

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
18.68	23.31	7.88

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
23	.835	.873	.792	.799	.843	.749	.932	.971	.844
50*	.917	.936	.896	.896	.919	.871			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
15.66	19.58	7.86

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
23	.838	.864	.810
50*	.918	.931	.904

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
109.47	118.32	5.93

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

SECOND ITEM SET--PRIMARY MENTAL ABILITIES PERCEPTUAL SPEED

Summary of Item Analysis For Commonly Retained Items For Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
622	91.20	1.520	0.38	0.81	Find flower like this.
614	89.44	1.289	0.40	0.58	Find leaf like this.
620	89.44	1.289	0.38	0.42	Find monkey like this.
615	89.08	1.247	0.48	0.26	Find dress like this.
617	86.62	0.977	0.47	0.73	Find cat like this.
616	82.75	0.619	0.45	0.50	Find turkey like this.
625	81.69	0.531	0.38	0.35	Find dog like this.
632	81.69	0.531	0.42	0.44	Find flower like this.
636	78.17	0.261	0.50	0.55	Find shape like this.
618	77.46	0.211	0.52	0.56	Find valentine like this.
633	76.06	0.113	0.46	0.56	Find fish like this.
635	75.35	0.065	0.40	0.05	Find shape like this.
627	74.30	0.006	0.47	0.64	Find face like this.
613	68.66	0.357	0.54	0.64	Find duck like this.
637	65.14	0.561	0.45	0.08	Find shape like this.
638	64.08	0.621	0.55	0.82	Find shape like this.
640	63.73	0.641	0.46	0.46	Find shape like this.
630	58.80	0.910	0.47	0.29	Find boat like this.
639	58.10	0.948	0.46	0.16	Find shape like this.
634	57.39	0.986	0.61	0.11	Find shape like this.
621	56.34	1.042	0.45	0.37	Find soldier like this.
623	55.63	1.079	0.42	0.07	Find bird like this.
631	47.54	1.502	0.47	0.53	Find rabbit like this.

THIRD ITEM SET--PRIMARY MENTAL ABILITIES NUMBER FACILITY

STEP I--FIRST ANALYSIS

Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
27	16	19	13	.917	.936	.895	.937	.949	.924

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
8.98	16.63	9.59

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
13	.890	.918	.858	.874	.903	.841	.969	.991	.895
50 *	.969	.977	.960	.964	.972	.955			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
5.58	9.50	8.45

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
13	.890	.909	.869
50*	.969	.974	.963

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
99.68	112.95	4.34

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

THIRD ITEM SET--PRIMARY MENTAL ABILITIES NUMBER FACILITY

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
641	90.12	3.261	0.48	0.20	Point to 3 scissors.
644	81.42	2.087	0.68	0.65	Point to 5 cups.
645	80.63	1.998	0.69	0.92	Point to 4 elephants.
642	71.94	1.057	0.76	0.36	Point to 6 sprinkling.
647	67.59	0.639	0.78	0.01	Point to 7 chickens.
648	65.61	0.456	0.78	0.23	Point to 8 snowmen.
650	65.22	0.420	0.58	0.00	Point to first and last.
646	56.13	- .366	0.80	0.04	Point to 11 keys.
643	48.22	-1.000	0.73	0.00	Point to 13 lamps.
653	30.92	-1.630	0.57	0.00	Point to all but 3.
663	37.55	-1.806	0.58	0.03	How many are 4 and 1.
649	35.97	-1.922	0.63	0.24	Point to 15 soldiers.
667	19.37	-3.189	0.43	0.00	How many is 18 minus.

FOURTH ITEM SET--COLUMBIA MENTAL MATURITY SCALE

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
57	47	47	41	.954	.964	.943	.899	.919	.877

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
41.77	51.36	8.96

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
41	.944	.957	.929	.890	.919	.856	.903	.947	.824
50*	.954	.965	.941	.908	.933	.880			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
33.25	39.36	7.78

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
41	.942	.953	.930
50 *	.952	.961	.942

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
121.68	135.98	6.55

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

FOURTH ITEM SET--COLUMBIA MENTAL MATURITY SCALE

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
700	94.37	1.660	0.46	0.91	Which does not belong.
707	94.37	1.660	0.46	0.91	Which does not belong.
703	93.90	1.542	0.47	0.89	Which does not belong.
704	93.90	1.542	0.46	0.11	Which does not belong.
692	93.43	1.429	0.32	0.00	Which does not belong.
712	92.96	1.322	0.51	0.84	Which does not belong.
721	92.96	1.322	0.58	0.84	Which does not belong.
697	92.02	1.122	0.52	0.55	Which does not belong.
702	92.02	1.122	0.48	0.20	Which does not belong.
699	91.55	1.027	0.49	0.27	Which does not belong.
711	91.08	0.935	0.57	0.62	Which does not belong.
713	91.08	0.935	0.60	0.75	Which does not belong.
694	90.61	0.847	0.55	0.59	Which does not belong.
693	89.67	0.677	0.52	0.48	Which does not belong.
706	89.67	0.677	0.56	0.34	Which does not belong.
709	89.67	0.677	0.58	0.71	Which does not belong.
717	89.67	0.677	0.58	0.71	Which does not belong.
719	89.20	0.596	0.48	0.03	Which does not belong.
704	88.73	0.517	0.53	0.17	Which does not belong.
708	88.73	0.517	0.64	0.39	Which does not belong.
715	88.73	0.517	0.55	0.42	Which does not belong.
718	88.73	0.517	0.63	0.29	Which does not belong.
724	88.73	0.517	0.58	0.42	Which does not belong.
696	88.26	0.440	0.60	0.14	Which does not belong.
695	87.79	0.364	0.60	0.16	Which does not belong.
720	87.79	0.364	0.59	0.51	Which does not belong.
716	86.85	0.218	0.61	0.16	Which does not belong.
723	86.38	0.148	0.65	0.04	Which does not belong.

FOURTH ITEM SET--(Continued)

Summary of Item Analysis for Commonly Retained Items
for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
714	85.45	0.011	0.54	0.05	Which does not belong.
726	77.46	-0.971	0.65	0.33	Which does not belong.
727	76.53	-1.070	0.68	0.07	Which does not belong.
730	73.24	-1.393	0.67	0.19	Which does not belong.
731	71.83	-1.522	0.55	0.68	Which does not belong.
735	67.14	-1.920	0.61	0.07	Which does not belong.
736	63.85	-2.174	0.49	0.29	Which does not belong.
725	62.91	-2.244	0.43	0.04	Which does not belong.
738	62.91	-2.244	0.53	0.04	Which does not belong.
728	60.56	-2.413	0.55	0.58	Which does not belong.
734	59.15	-2.511	0.42	0.03	Which does not belong.
737	57.28	-2.640	0.44	0.01	Which does not belong.
732	54.93	-2.795	0.54	0.74	Which does not belong.

FIFTH ITEM SET--DRAW-A-PERSON TEST

STEP I--FIRST ANALYSIS

Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
73	44	57	37	.887	.912	.860	.900	.920	.878

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
10.91	15.62	5.85

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
37	.830	.867	.788	.858	.886	.827	.962	.980	.927
50*	.868	.897	.836	.891	.913	.869			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
5.83	8.38	5.31

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined
for Commonly Retained Items

No. of Items	Reliability		
		95% Confidence Limits	
	r	Upper	Lower
37	.852	.874	.828
50*	.886	.903	.868

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
65.08	73.92	4.14

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

FIFTH ITEM SET--DRAW-A-PERSON TEST

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1611	96.00	7.277	0.25	0.84	Dap-eyes.
1637	78.15	4.851	0.50	0.70	Dap-arms.
1616	76.92	4.751	0.44	0.00	Dap-nose.
1653	71.69	4.352	0.57	0.02	Dap-trunk.
1646	67.38	4.051	0.54	0.69	Dap-feet.
1621	58.15	3.448	0.53	0.10	Dap-chin forehead.
1631	47.08	2.753	0.64	0.30	Dap-fingers.
1654	43.69	2.539	0.53	0.15	Dap-trunk-proportion.
1662	42.46	2.461	0.65	0.69	Dap-clothing.
1613	20.00	0.822	0.37	0.01	Dap-eyes-pupil.
1660	15.69	0.409	0.48	0.39	Dap-proportion-legs.
1663	14.15	0.244	0.52	0.48	Dap-clothing.
1661	13.54	0.174	0.53	0.49	Dap-prop-limbs-2 dime.
1632	11.38	-0.087	0.38	0.76	Dap-fingers-number.
1643	9.54	-0.341	0.36	0.39	Dap-hip 1.
1658	9.23	-0.387	0.38	0.33	Dap-proportion-arms 1.
1647	8.92	-0.434	0.45	0.42	Dap-feet-proportion.
1671	8.92	-0.434	0.41	0.97	Dap-motor coordination.
1610	8.62	-0.482	0.40	0.97	Dap-neck-2 dimension.
1636	7.08	-0.745	0.42	0.70	Dap-wrist or ankle.
1640	7.08	-0.745	0.39	0.96	Dap-arms-at side-act.
1648	6.77	-0.802	0.37	0.28	Dap-feet-heel.
1638	6.46	-0.862	0.34	0.55	Dap-shoulders.
1624	3.69	-1.543	0.20	0.39	Dap-bridge of nose.
1674	3.69	-1.543	0.33	0.95	Dap-directed lines.
1614	3.38	-1.644	0.30	0.66	Dap-eyes-proportion.
1615	3.08	-1.753	0.23	0.64	Dap-eyes-glance.

FIFTH ITEM SET--(Continued)

Summary of Item Analysis for Commonly Retained Items
for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
1650	3.08	-1.753	0.26	0.08	Dap-feet-detail.
1664	3.08	-1.753	0.31	0.96	Dap-clothing.
1630	2.15	-2.149	0.22	0.85	Dap-ears-proportion.
1623	1.85	-2.315	0.20	0.67	Dap-line of jaw.
1675	1.23	-2.744	0.21	0.99	Dap-directed lines.
1628	0.92	-3.041	0.08	0.00	Dap-hair.
1649	0.92	-3.041	0.15	0.80	Dap-feet-perspective.
1678	0.92	-3.041	0.11	0.11	Dap-modeling technique.
1680	0.92	-3.041	0.12	0.84	Dap-leg movement.
1656	0.62	-3.453	0.12	0.93	Dap-proportion-head.

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
21	.798	.843	.747	.787	.827	.742	.944	.978	.866
50*	.904	.925	.880	.898	.917	.877			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
12.00	14.64	6.57

SIXTH ITEM SET--MARIANNE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
72	38	39	21	.904	.933	.870	.916	.931	.899

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
39.55	48.11	7.49

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
		95% Confidence Limits	
	r	Upper	Lower
21	.810	.838	.780
50*	.910	.923	.896

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
106.12	115.96	6.21

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

SIXTH ITEM SET--MARIANNE FROSTIG
DEVELOPMENTAL TEST OF VISUAL PERCEPTION

Summary of Item Analysis for Commonly Retained Items
for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
548	98.01	3.572	0.26	0.85	Point to table-not same.
492	97.72	3.424	0.14	0.03	Draw line from mouse.
508	97.44	3.293	0.28	0.96	Outline triangle.
493	94.87	2.495	0.27	0.74	Draw line from house.
509	90.60	1.752	0.37	0.24	Outline rectangle.
529	79.49	0.667	0.32	0.00	Outline square.
547	78.35	0.582	0.40	0.00	Outline circle.
510	75.78	0.400	0.57	0.03	Outline cross.
549	75.78	0.400	0.48	0.97	Point to chair-not same.
543	74.36	0.304	0.43	0.00	Outline square.
550	74.07	0.285	0.54	0.25	Point to moon-not same.
552	71.51	0.119	0.51	0.13	Copy lines joining dots.
495	56.70	0.747	0.52	0.09	Draw line from car.
512	52.99	0.952	0.70	0.00	Outline two stars.
504	48.15	1.222	0.31	0.00	Draw line from tree.
553	46.15	1.333	0.60	0.22	Copy lines joining dots.
526	36.47	1.894	0.51	0.36	Outline circle.
541	31.62	2.194	0.54	0.02	Outline square.
518	30.48	2.267	0.51	0.08	Outline square.
500	19.94	3.026	0.47	0.02	Cover black line.
562	13.11	3.658	0.52	0.31	Copy lines joining dots.

SEVENTH ITEM SET--STANFORD-BINET INTELLIGENCE SCALE

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
99	69	62	48	.963	.967	.959	.947	.952	.942

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
55.73	77.77	25.13

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
48	.939	.946	.932	.870	.883	.856	.970	.983	.946
50*	.941	.948	.935	.875	.887	.861			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
33.11	42.34	22.90

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
48	.942	.946	.938
50*	.944	.948	.940

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
114.37	139.64	24.54

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

SEVENTH ITEM SET--STANFORD-BINET INTELLIGENCE SCALE

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
117	97.30	2.806	0.28	0.01	What is hat.
100	97.01	2.671	0.26	0.03	Which prettier-2 girl.
99	96.71	2.548	0.25	0.01	Which prettier-2 girl.
101	95.69	2.179	0.32	0.01	Which prettier-2 men.
116	95.62	2.156	0.33	0.00	What is ball.
118	95.40	2.088	0.38	0.66	What is stove.
94	94.96	1.959	0.36	0.48	Matching 10 geometric.
123	94.74	1.899	0.38	0.29	Are these 2 the same.
125	94.67	1.879	0.41	0.07	Are these 2 the same.
126	94.67	1.879	0.39	0.48	Are these 2 the same.
96	94.08	1.728	0.40	0.68	Why do we have books.
128	94.08	1.728	0.42	0.64	Are these 2 the same.
121	93.72	1.640	0.45	0.71	Are these 2 the same.
89	93.43	1.573	0.38	0.51	Point what carry in.
110	92.48	1.369	0.44	1.00	What do with eyes.
122	92.48	1.369	0.46	0.74	Are these 2 the same.
124	92.26	1.325	0.48	0.22	Are these 2 the same.
103	91.38	1.159	0.44	0.67	Which not same.
102	91.31	1.145	0.43	0.56	Which not same.
127	90.65	1.029	0.48	0.83	Are these 2 the same.
104	90.58	1.017	0.45	0.21	Which not same.
112	89.19	0.793	0.40	0.40	Finish drawing man.
129	89.04	0.770	0.52	0.69	Are these 2 the same.
95	88.97	0.759	0.50	0.52	Why do we have houses.
135	88.09	0.630	0.41	0.00	What is not there on.
97	87.07	0.489	0.39	0.00	Repeat sentence-9 words.
107	86.19	0.373	0.55	0.59	What house made of.
92	85.54	0.290	0.51	0.67	Point what shines sky.
106	84.59	0.175	0.54	0.91	Which not same.
140	82.62	-0.050	0.56	0.04	Give me 3 blocks.
105	81.88	-0.129	0.56	0.04	Which not same.
90	78.82	-0.440	0.55	0.31	Point what gives milk.
111	78.52	-0.469	0.61	0.50	What do with ears.

SEVENTH ITEM SET--(Continued)

Summary of Item Analysis for Commonly Retained Items
for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Ras. Para.	Pt. Bis. r	Prob.	Verbal Description
145	77.94	-0.524	0.62	0.14	Stable made of wood.
108	77.06	-0.606	0.61	0.09	What window made of.
115	73.70	-0.904	0.52	0.00	Paper folding-triangle.
149	71.29	-1.106	0.51	0.00	Maze tracing-boy to.
84	68.37	-1.340	0.61	0.03	Daytime light, night.
113	65.08	-1.593	0.54	0.00	Finish drawing man.
87	64.28	-1.653	0.61	0.37	Sun shines day, moon.
86	58.80	-2.054	0.65	0.60	Snail slow, rabbit.
139	58.58	-2.070	0.61	0.08	What is not there on.
134	51.35	-2.584	0.59	0.00	How wood and glass.
159	36.01	-3.701	0.56	0.00	How ship and auto alike.
161	28.93	-4.273	0.62	0.00	Copying a diamond.
177	14.83	-5.704	0.54	0.00	Repeating 3 digits.
176	13.22	-5.913	0.52	0.00	Repeating 3 digits.
175	10.45	-6.316	0.46	0.00	Repeating 3 digits.

EIGHTH ITEM SET--WPPSI PICTURE COMPLETION

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
23	16	18	12	.858	.873	.842	.836	.853	.818

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
10.45	16.47	25.87

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
12	.769	.795	.742	.730	.758	.700	.979	.994	.926
50*	.933	.940	.925	.919	.927	.910			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
5.74	8.92	23.63

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
12	.809	.824	.794
50*	.946	.950	.942

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
98.49	122.85	21.85

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

EIGHTH ITEM SET--WPPSI PICTURE COMPLETION

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
264	97.72	4.453	0.23	0.04	Find what missing-wagon
266	92.05	2.857	0.44	0.08	Find what missing-roses
269	90.88	2.650	0.44	0.10	Find what missing-table
268	85.72	1.917	0.54	0.15	Find what missing-fox
272	71.30	0.494	0.59	0.00	Find what missing-cat
273	62.77	0.170	0.68	0.26	Find what missing-bridge
274	58.13	0.506	0.67	0.87	Find what missing-c. line
278	54.89	0.736	0.68	0.05	Find what missing-swing
275	45.25	1.410	0.68	0.05	Find what missing-watch
279	42.38	1.613	0.69	0.08	Find what missing-doll
281	31.35	2.433	0.62	0.62	Find what missing-coat
285	4.71	5.504	0.22	0.00	Find what missing-screw

NINTH ITEM SET--MINNESOTA PRESCHOOL SCALE

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
89	58	45	30	.922	.938	.904	.903	.922	.882

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
59.57	73.93	13.89

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
30	.867	.894	.836	.827	.862	.788	.940	.971	.876
50*	.916	.933	.897	.887	.911	.864			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
17.54	24.04	12.55

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

No. of Items	Reliability		
		95% Confidence Limits	
	r	Upper	Lower
30	.894	.909	.877
50*	.934	.943	.923

* Spearman-Brown reliability estimates based on 50 items.

Test of Differences of Interval Score Means

Disadvantaged	Advantaged	z
107.05	128.10	12.53

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

NOT APPLICABLE

NINTH ITEM SET--MINNESOTA PRESCHOOL SCALE

Summary of Item Analysis for Commonly Retained Items for Disadvantaged and Advantaged Groups Combined

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1333	99.13	4.304	0.09	0.00	Copy horiz. stroke.
1381	98.84	4.007	0.11	0.15	Digit span-3 digits.
1394	98.26	3.581	0.14	0.09	Define fork.
1392	95.94	2.638	0.28	0.15	Mutilated picture.
1409	95.36	2.480	0.18	0.13	Make arms like clock.
1324	93.33	2.033	0.30	0.12	Show me dolls chin.
1354	91.01	1.640	0.38	0.11	What should do if.
1368	91.01	1.640	0.46	0.21	Name colors-white.
1359	90.43	1.554	0.32	0.12	Take away game-3.
1365	87.83	1.208	0.49	0.16	Name colors-red.
1393	87.54	1.173	0.39	0.17	Mutilated picture.
1366	84.06	0.790	0.52	0.16	Name colors-blue.
1382	83.19	0.703	0.45	0.10	Digit span-4 digits.
1407	80.87	0.484	0.55	0.16	Make arms like clock.
1386	78.55	0.280	0.56	0.15	Paper folding-3 folds.
1364	76.52	0.111	0.39	0.08	Recognition of forms.
1334	75.94	0.064	0.61	0.20	Copy vertical cross.
1347	65.80	-0.684	0.56	0.05	Knox cube imitation.
1410	64.64	-0.764	0.52	0.11	Make arms like clock.
1402	62.03	-0.940	0.60	0.11	2 opposites-bad.
1405	54.78	-1.417	0.69	0.10	Opposites-dark.
1404	50.14	-1.716	0.66	0.15	Opposites-dry.
1390	46.67	-1.941	0.61	0.07	Verbal absurdities.
1385	45.22	-2.035	0.66	0.07	Picture puzzle-6 pieces.
1335	44.64	-2.072	0.72	0.11	Copy drawings-circle.
1348	41.74	-2.262	0.54	0.07	Knox cube imitation.
1349	35.07	-2.710	0.56	0.11	Knox cube imitation.
1406	28.99	-3.144	0.59	0.07	Opposites-sick.
1399	16.23	-4.224	0.44	0.09	Define health.
1403	11.30	-4.780	0.46	0.21	Opposites-thick.

TENTH ITEM SET--PRIMARY MENTAL ABILITIES VERBAL MEANING

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
42	28	33	24	.820	.859	.775	.869	.894	.842

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
22.84	31.83	12.09

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
24	.768	.819	.710	.785	.826	.739	.815	.917	.614
50*	.873	.901	.842	.884	.906	.859			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
13.95	18.70	10.13

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
28	.775	.824	.719
50 *	.860	.891	.826

* Spearman-Brown reliability estimates based on 50 items.

TENTH ITEM SET--PRIMARY MENTAL ABILITIES VERBAL MEANING

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
576	87.67	1.782	0.38	0.47	Point to what wear.
570	82.19	1.322	0.28	0.58	Point to bottle cap.
577	81.51	1.272	0.23	0.07	Point to thing that k.
594	74.66	0.831	0.39	0.20	To talk far away, use.
592	71.23	0.638	0.13	0.11	What used to sharpen.
584	68.49	0.492	0.28	0.00	Which food grows under.
591	67.81	0.457	0.33	0.64	Where change kept.
569	65.75	0.352	0.44	0.68	Point to artist.
598	65.07	0.318	0.47	0.25	Find bird on branch.
602	65.07	0.318	0.52	0.38	Find school children.
573	63.01	0.217	0.51	0.42	Point to what helps.
600	63.01	0.217	0.32	0.03	Find Joe bouncing ball.
586	61.64	0.151	0.49	0.13	Which ask for help.
582	60.96	0.118	0.46	0.03	Which grows food we e.
565	60.27	0.086	0.39	0.31	Point to spear.
564	57.53	-0.043	0.46	0.80	Point to crown.
596	57.53	-0.043	0.48	0.31	Find 2 men carrying.
590	54.11	-0.202	0.28	0.81	Which has engineer.
597	50.68	-0.359	0.34	0.09	Find father resting.
604	49.32	-0.422	0.30	0.07	Find what see at acci.
571	47.95	-0.485	0.25	0.01	Point to fastest way.
580	47.26	-0.517	0.46	0.37	Which used to hang.
572	46.58	-0.548	0.32	0.68	Point to what wakes.
585	42.47	-0.739	0.25	0.09	Which keep inside.
574	37.67	-0.968	0.49	0.35	Point to what flies.
581	35.62	-1.069	0.36	0.39	Which tells how cold.
568	34.93	-1.103	0.34	0.04	Point to beast.
579	18.49	-2.072	0.46	0.23	What help you see.

ELEVENTH ITEM SET--PRIMARY MENTAL ABILITIES SPATIAL RELATIONS

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
24	19	15	12	.860	.891	.824	.899	.918	.878

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
9.03	14.92	9.54

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
12	.713	.780	.635	.821	.857	.781	.922	.978	.740
50 *	.912	.932	.889	.950	.960	.940			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
4.05	6.99	9.05

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
19	.824	.866	.782
50*	.926	.943	.908

* Spearman-Brown reliability estimates based on 50 items.

ELEVENTH ITEM SET--PRIMARY MENTAL ABILITIES SPATIAL RELATIONS

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
672	73.53	2.416	0.44	0.27	Which picture completes.
674	62.50	1.752	0.50	0.09	Which picture completes.
670	61.76	1.710	0.44	0.76	Which picture completes.
668	58.09	1.507	0.40	0.03	Which picture completes.
680	54.41	1.307	0.65	0.44	Make pict. like teach.
681	47.06	0.911	0.70	0.11	Make pict. like teach.
676	46.32	0.871	0.57	0.34	Which picture completes.
673	44.12	0.751	0.53	0.04	Which picture completes.
675	40.44	0.547	0.47	0.36	Which picture completes.
685	37.50	0.380	0.43	0.04	Make pict. like teach.
686	34.56	0.207	0.57	0.54	Make pict. like teach.
677	33.82	0.163	0.37	0.08	Which picture completes.
682	33.82	0.163	0.63	0.38	Make pict. like teach.
684	31.62	0.028	0.60	0.24	Make pict. like teach.
683	29.41	-0.112	0.55	0.23	Make pict. like teach.
687	25.00	-0.411	0.60	0.22	Make pict. like teach.
689	5.15	-2.681	0.16	0.15	Make pict. like teach.
690	0.74	-4.754	0.21	1.00	Make pict. like teach.
691	0.74	-4.754	0.11	1.00	Make pict. like teach.

TWELFTH ITEM SET--ITPA AUDITORY-VOCAL ASSOCIATION

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
26	17	22	14	.818	.854	.778	.804	.842	.762

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
12.12	18.09	15.58

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
14	.760	.809	.705	.742	.795	.682	.943	.982	.826
50*	.919	.935	.901	.911	.929	.891			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
7.39	11.20	14.12

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
17	.786	.829	.738
50*	.915	.932	.896

* Spearman-Brown reliability estimates based on 50 items.

TWELFTH ITEM SET--ITPA AUDITORY-VOCAL ASSOCIATION

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
928	95.53	3.861	0.45	0.88	Bird flies in air.
926	93.85	3.435	0.43	0.76	Sit on chair, sleep.
930	91.62	3.004	0.43	0.90	John is boy, Mary is.
927	88.83	2.587	0.32	0.04	Eat from plate, drink.
934	86.03	2.251	0.52	0.12	Red light-stop, green.
935	80.45	1.711	0.53	0.34	Day-we awake, night.
931	72.63	1.116	0.34	0.03	Scissors cuts, pencil.
938	54.19	-0.000	0.51	0.40	Boy runs, old man.
937	50.84	-0.188	0.54	0.01	Hands have fingers, feet.
943	37.99	-0.925	0.59	0.77	Pickle is fat, pencil.
939	37.43	-0.958	0.62	0.43	Cotton is soft, stones.
944	27.93	-1.572	0.43	0.01	Coffee is bitter, sugar.
941	25.70	-1.732	0.60	0.42	Mts. are high, valley.
942	24.58	-1.816	0.55	0.36	Man is a king, woman.
940	20.11	-2.178	0.58	0.55	Explosion is loud, whisper.
946	7.82	-3.643	0.39	0.07	Penny is round, ruler.
947	2.79	-4.953	0.18	0.58	Rabbit is swift, turtle.

THIRTEENTH ITEM SET--ITPA AUDITORY DECODING TEST

STEP I--FIRST ANALYSIS

Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
36	25	24	15	.876	.901	.849	.859	.886	.829

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
15.56	24.68	15.61

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
15	.802	.863	.728	.710	.770	.642	.626	.862	.162
50*	.931	.952	.906	.891	.913	.866			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
1.50	6.19	13.59

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined
for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
25	.851	.881	.818
50*	.920	.935	.902

* Spearman-Brown reliability estimates based on 50 items.

THIRTEENTH ITEM SET--ITPA AUDITORY DECODING TEST

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
1006	94.44	5.528	0.46	0.80	Do apples fly.
1000	92.22	5.048	0.17	0.00	Do you smoke.
1002	90.00	4.670	0.44	0.70	Do you fly.
1008	87.78	4.355	0.43	0.00	Do bananas telephone.
1003	87.22	4.284	0.42	0.00	Do you bark.
1009	82.22	3.722	0.42	0.00	Do balls bounce.
1007	78.89	3.406	0.46	0.21	Do dresses drive.
1012	60.56	2.026	0.53	0.00	Do pincushions cheer.
1016	44.44	0.978	0.51	0.02	Do dials yawn.
1021	28.89	-0.130	0.61	0.00	Do weasels knit.
1018	28.33	-0.175	0.48	0.00	Do scouts signal.
1022	15.56	-1.400	0.55	0.75	Do dentists drill.
1023	15.56	-1.400	0.59	0.60	Do penguins waddle.
1025	12.78	-1.742	0.55	0.78	Do monograms lubricate.
1027	11.11	-1.969	0.57	0.51	Do microscopes magnify.
1028	9.44	-2.218	0.49	0.36	Do syringes meditate.
1026	8.89	-2.308	0.48	0.82	Do carpenters kneel.
1024	8.33	-2.401	0.48	0.95	Do pigeons drink.
1030	7.78	-2.498	0.51	0.82	Do moles burrow.
1029	7.22	-2.601	0.46	0.15	Do cannisters illuminate.
1034	6.11	-2.823	0.45	0.85	Do meteorites collide.
1032	5.56	-2.946	0.37	0.30	Do abrasions cogitate.
1033	5.56	-2.946	0.41	0.63	Do chateaux chastise.
1035	5.00	-3.079	0.39	0.94	Do females slumber.
1031	3.89	-3.383	0.34	0.92	Do carbohydrates nourish.

FOURTEENTH ITEM SET--ITPA VISUAL-MOTOR SEQUENCING

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
					95% Confidence Limits			95% Confidence Limits	
Initial	Disadvantaged	Advantaged	Common	r	Upper	Lower	r	Upper	Lower
15	13	9	8	.822	.858	.782	.754	.803	.700

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
6.30	9.01	9.67

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
8	.703	.768	.628	.666	.734	.588	.986	.998	.920
50*	.938	.950	.922	.926	.940	.910			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
2.19	3.75	8.45

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
13	.819	.856	.777
50*	.946	.957	.934

* Spearman-Brown reliability estimates based on 50 items.

FOURTEENTH ITEM SET--ITPA VISUAL-MOTOR SEQUENCING

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1039	97.70	8.242	0.25	0.86	Three geometric chips.
1038	87.36	5.670	0.43	0.00	Three picture chips.
1040	75.29	4.181	0.60	0.28	Three geometric chips.
1041	55.17	2.510	0.66	0.44	Four geometric chips.
1042	45.40	1.772	0.68	0.31	Four geometric chips.
1043	21.26	-0.525	0.68	0.87	Four geometric chips.
1044	20.69	-0.603	0.64	0.09	Four geometric chips.
1045	11.49	-2.218	0.61	0.88	Four geometric chips.
1046	9.77	-2.631	0.66	0.37	Five geometric chips.
1047	8.62	-2.933	0.57	0.58	Five geometric chips.
1048	6.32	-3.621	0.53	0.94	Five geometric chips.
1049	4.02	-4.483	0.46	0.98	Six geometric chips.
1050	2.30	-5.360	0.33	0.97	Six geometric chips.

FIFTEENTH ITEM SET--ITPA AUDITORY-VOCAL SEQUENCING

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
20	14	13	11	.818	.855	.777	.830	.863	.793

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
10.57	11.42	2.58

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
11	.690	.754	.618	.771	.816	.720	.993	.998	.972
50*	.910	.928	.890	.939	.950	.926			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
4.04	4.57	2.68

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
14	.781	.825	.731
50*	.927	.942	.911

* Spearman-Brown reliability estimates based on 50 items.

FIFTEENTH ITEM SET--ITPA AUDITORY-VOCAL SEQUENCING

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
954	98.88	10.652	0.25	0.99	Repeat 3 digits.
955	97.75	9.645	0.25	0.00	Repeat 3 digits.
956	95.51	8.356	0.47	0.71	Repeat 3 digits.
959	81.46	4.712	0.71	0.40	Repeat 4 digits.
961	65.73	2.401	0.77	0.12	Repeat 4 digits.
962	39.89	-0.483	0.70	0.04	Repeat 5 digits.
964	28.65	-1.735	0.66	0.37	Repeat 5 digits.
965	18.54	-2.915	0.55	0.48	Repeat 6 digits.
966	16.29	-3.201	0.54	0.37	Repeat 6 digits.
967	7.87	-4.494	0.36	0.17	Repeat 6 digits.
968	7.87	-4.494	0.39	0.21	Repeat 6 digits.
970	3.37	-5.640	0.28	0.83	Repeat 7 digits.
971	2.81	-5.864	0.24	0.70	Repeat 7 digits.
969	1.12	-6.941	0.19	0.96	Repeat 7 digits.

SIXTEENTH ITEM SET--STANFORD BINET INTELLIGENCE SCALE

STEP I--FIRST ANALYSIS

Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
99	75	9	-	.920	.928	.911	.804	.823	.782

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
85.91	94.04	19.71

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

NOT APPLICABLE

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
*									

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

NOT APPLICABLE

Disadvantaged	Advantaged	z

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
75	.904	.915	.893
50*	.863	.878	.847

* Spearman-Brown reliability estimates based on 50 items.

SIXTEENTH ITEM SET--STANFORD BINET INTELLIGENCE SCALE

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1	99.84	3.903	0.11	1.00	Three-hole form board.
44	99.68	3.212	0.16	1.00	What is this-chair.
45	99.52	2.804	0.17	1.00	What is this-auto.
15	99.36	2.513	0.11	0.61	Picture voc. hat.
38	99.36	2.513	0.10	0.12	What drink out of.
6	99.20	2.285	0.18	0.83	Identify body-mouth.
47	99.04	2.098	0.14	0.62	What is this-key.
57	99.04	2.098	0.18	0.99	Stringing beads.
9	98.89	1.938	0.16	0.34	Identify body-nose.
14	98.89	1.938	0.19	0.93	Picture voc. telephone.
18	98.89	1.938	0.13	0.06	Picture voc. key.
8	98.73	1.799	0.18	0.99	Identify body-ear.
32	98.57	1.676	0.18	0.04	Point to dog.
16	98.41	1.565	0.18	0.82	Picture voc. ball.
33	98.41	1.565	0.22	0.15	Point to ball.
5	98.25	1.464	0.18	0.75	Identify body-hair.
13	98.25	1.464	0.18	0.28	Picture voc. airplane.
35	98.09	1.371	0.20	0.00	Point to bed.
46	98.09	1.371	0.15	0.18	What is this-box.
56	98.09	1.371	0.15	0.33	3-hole form board-rot.
10	97.77	1.205	0.16	0.60	Identify body-hands.
54	97.77	1.205	0.24	0.96	Put button in box.
50	97.61	1.130	0.26	0.03	Repeating 2 digits.
17	96.97	0.870	0.28	0.95	Picture voc. tree.
37	96.82	0.813	0.25	0.08	Point to scissors.
48	96.82	0.813	0.19	0.20	What is this-fork.
62	96.66	0.758	0.26	0.65	Drawing a vertical line.
42	96.34	0.655	0.26	0.67	What ride in-point.
76	96.34	0.655	0.28	0.71	Sorting buttons.
39	96.18	0.607	0.25	0.10	Wear on feet-point.
36	95.86	0.515	0.25	0.10	Point to doll.
69	95.86	0.515	0.28	0.27	Discrimination of ani.
61	95.38	0.388	0.33	0.73	Copying circle.

SIXTEENTH ITEM SET--(Continued)

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Est. Para.	Pt. Bis. r	Prob.	Verbal Description
70	95.38	0.388	0.25	0.74	Resp. to pict.
67	95.22	0.348	0.35	0.05	Put pieces together.
99	95.22	0.348	0.23	0.20	Which prettier-2 girls.
72	95.06	0.310	0.23	0.01	Resp. to pict.
51	94.90	0.272	0.20	0.36	Repeating 2 digits.
19	94.75	0.236	0.29	0.36	Picture voc. horse.
52	94.59	0.200	0.24	0.07	Repeating 2 digits.
88	94.43	0.165	0.23	0.30	Point what cook on.
74	93.63	0.003	0.38	0.44	Resp. to pict.
41	92.83	-0.143	0.31	0.02	What cut with.
63	92.04	-0.277	0.30	0.02	Repeating digits.
4	91.24	-0.400	0.26	0.02	Hiding cat-left box.
34	91.24	-0.400	0.24	0.15	Point to engine.
79	90.92	-0.446	0.35	0.78	Comparison of sticks.
22	90.76	-0.469	0.47	0.31	Picture voc. ship
59	90.61	-0.492	0.33	0.03	Picture memories-find.
94	90.61	-0.492	0.40	0.32	Matching 10 geometric.
66	89.97	-0.579	0.34	0.49	Which ball is bigger.
49	89.01	-0.703	0.46	0.73	What is this-flag.
68	89.01	-0.703	0.44	0.58	Put pieces together.
40	88.85	-0.723	0.32	0.31	What buy candy-point.
55	88.22	-0.800	0.30	0.01	Put scissors beside.
96	87.74	-0.856	0.47	0.57	Why do we have books.
89	87.42	-0.892	0.44	0.31	Point what carry in.
65	86.94	-0.946	0.39	0.02	Repeating digits.
78	85.03	-1.146	0.37	0.07	Why we need stoves.
60	84.71	-1.177	0.47	0.01	Picture memories-find.
81	82.48	-1.386	0.42	0.76	What hide under box.
25	81.05	-1.512	0.50	0.99	Picture voc. flag.
97	78.66	-1.707	0.36	0.01	Repeat sentence-9words.
95	78.50	-1.720	0.56	0.30	Why do we have houses.
83	76.11	-1.902	0.50	0.38	Brother boy, sister.

SIXTEENTH ITEM SET--(Continued)

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Ras. Para.	Pt. Bis. r	Prob.	Verbal Description
92	72.77	-2.140	0.54	0.26	Point what shines sky.
30	63.85	-2.711	0.52	0.55	Picture voc. leaf.
85	63.85	-2.711	0.47	0.02	Father man, mother.
98	61.31	-2.863	0.51	0.07	Repeat sentence-10 words.
77	58.28	-3.039	0.57	0.46	What do when thirsty.
75	54.30	-3.266	0.52	0.21	Resp. to pict.
84	46.34	-3.711	0.58	0.73	Daytime light, night.
87	39.01	-4.126	0.50	0.62	Sun shines day, moon.
73	34.24	-4.406	0.44	0.31	Resp. to pict.
86	33.60	-4.444	0.56	0.85	Snail slow, rabbit.

SEVENTEENTH ITEM SET--WPPSI INFORMATION

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
23	15	13	10	.846	.863	.828	.785	.806	.762

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
11.00	15.74	23.42

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
10	.751	.779	.721	.653	.689	.614	.975	.994	.894
50 *	.938	.945	.931	.804	.914	.894			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
5.84	8.11	20.79

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
15	.799	.821	.776
50*	.930	.937	.922

* Spearman-Brown reliability estimates based on 50 items.

SEVENTEENTH ITEM SET--WPPSI INFORMATION

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
218	94.61	4.689	0.30	0.10	How many ears do you.
220	90.14	3.857	0.46	0.18	What comes in bottle.
219	81.05	2.792	0.55	0.11	Which finger-thumb.
222	76.12	2.356	0.51	0.23	What color is grass.
225	72.27	2.051	0.58	0.58	What shines in sky at.
224	65.02	1.531	0.60	0.27	From what animal get.
230	54.24	0.827	0.62	0.36	What needed to make.
226	52.85	0.739	0.58	0.00	How many legs has a.
229	49.46	0.526	0.62	0.02	Name two things round.
228	46.38	0.331	0.64	0.50	What needed to join.
227	41.91	0.046	0.56	0.05	What put on letter.
235	11.86	-2.512	0.48	0.00	What bread made of.
238	1.54	-5.423	0.27	0.20	How many makes a dozen.
236	1.39	-5.554	0.25	0.20	Name four seasons.
239	0.77	-6.258	0.21	1.00	Where does sun set.

EIGHTEENTH ITEM SET--WPPSI VOCABULARY

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
22	18	16	13	.803	.824	.781	.779	.801	.756

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
9.48	14.65	30.87

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
13	.662	.699	.623	.620	.659	.579	.984	.995	.945
50*	.883	.895	.870	.863	.876	.848			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
6.21	8.50	26.21

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
18	.764	.790	.737
50 *	.900	.911	.889

* Spearman-Brown reliability estimates based on 50 items.

EIGHTEENTH ITEM SET--WPPSI VOCABULARY

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
244	98.33	6.728	0.22	0.96	Define hat.
243	96.20	5.753	0.27	0.04	Define bicycle.
241	95.90	5.656	0.28	0.11	Define shoe.
242	95.90	5.656	0.30	0.00	Define knife.
245	89.67	4.380	0.44	0.22	Define umbrella.
247	80.09	3.270	0.49	0.00	Define letter.
246	78.42	3.114	0.54	0.01	Define nail.
252	29.94	-0.587	0.63	0.05	Define snap.
251	24.62	-1.072	0.67	0.01	Define castle.
253	17.63	-1.808	0.60	0.79	Define fur.
256	15.81	-2.028	0.57	0.05	Define join.
258	10.03	-2.853	0.49	0.44	Define diamond.
255	6.84	-3.461	0.43	0.00	Define moth.
257	5.93	-3.672	0.43	0.80	Define hero.
262	3.95	-4.238	0.33	0.69	Define gamble.
261	2.43	-4.865	0.29	0.57	Define microscope.
259	2.28	-4.945	0.29	0.94	Define chisel.
260	2.13	-5.030	0.25	0.92	Define nuisance.

NINETEENTH ITEM SET--WPPSI ARITHMETIC

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
20	12	9	6	.807	.828	.785	.844	.860	.827

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
8.44	12.43	21.00

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
6	.604	.650	.555	-.380	-	-	.326	.900	-.660
50*	.927	.935	.919	-	-	-			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
3.71	4.71	16.22

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
12	.732	.762	.701
50*	.919	.928	.910

* Spearman-Brown reliability estimates based on 50 items.

NINETEENTH ITEM SET--WPPSI ARITHMETIC

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
287	97.07	6.304	0.26	0.04	Find longest stick on.
290	90.76	4.661	0.53	0.14	How many blocks-two.
291	81.20	3.300	0.64	0.20	How many blocks-four.
292	66.72	1.948	0.68	0.04	How many blocks-nine.
293	54.70	1.064	0.70	0.09	Leave four blocks in.
289	52.23	0.894	0.62	0.00	Which bowl has most.
295	45.61	0.445	0.62	0.01	How many pennies-2.
297	21.57	-1.329	0.50	0.00	How many dolls-5.
300	9.24	-2.750	0.41	0.01	How much candy-1.
302	4.01	-3.905	0.31	0.06	How many crayons-2.
304	1.85	-4.840	0.19	0.00	How many papers-12.
305	0.77	-5.791	0.17	0.89	How many marbles-8.

TWENTIETH ITEM SET--ARTHUR ADAPTATION OF THE LEITER INTERNATIONAL PERFORMANCE SCALE

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
24	17	10	10	.804	.846	.757	.740	.805	.665

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
18.21	22.02	10.98

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
10	.759	.814	.695	.611	.732	.463	.908	.978	.649
50*	.940	.954	.925	.887	.921	.847			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
6.82	9.11	10.49

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined
for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
17	.779	.828	.723
50 *	.912	.931	.890

* Spearman-Brown reliability estimates based on 50 items.

TWENTIETH ITEM SET--
ARTHUR ADAPTATION OF THE LEITER INTERNATIONAL PERFORMANCE SCALE

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1140	99.32	4.294	0.16	0.99	Matching colors.
1148	99.32	4.294	0.14	0.99	Form, color.
1142	98.63	3.603	0.17	0.72	Matching pictures.
1143	97.26	2.873	0.20	0.54	Matching circles, squares.
1149	97.26	2.873	0.23	0.85	Eight forms.
1146	92.47	1.649	0.36	0.72	Picture completion.
1145	91.78	1.529	0.38	0.92	Block design (2 color).
1154	87.67	0.920	0.44	0.31	Clothing.
1147	86.30	0.746	0.53	0.29	Number discrimination.
1153	82.88	0.350	0.53	0.41	Two color circles.
1151	78.08	-0.142	0.63	0.85	Form, color number.
1155	71.23	-0.770	0.66	0.48	Block design (diagonal).
1150	69.18	-0.948	0.66	0.79	Counts four.
1160	28.08	-4.315	0.70	0.56	Reconstruction (sigma).
1159	24.66	-4.613	0.59	0.11	Block design (quarter).
1161	11.64	-5.974	0.40	0.03	Circle series.
1162	8.90	-6.368	0.39	0.82	Circumference series.

TWENTY-FIRST ITEM SET--MERRILL-PALMER SCALE

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
					95% Confidence Limits			95% Confidence Limits	
Initial	Disadvantaged	Advantaged	Common	r	Upper	Lower	r	Upper	Lower
31	22	10	-	.822	.859	.781	.617	.700	.524

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
23.17	28.90	15.88

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

NOT APPLICABLE

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
*									

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

NOT APPLICABLE

Disadvantaged	Advantaged	z

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
22	.804	.845	.758
50*	.903	.923	.881

* Spearman-Brown reliability estimates based on 50 items.

TWENTY-FIRST ITEM SET--MERRILL-PALMER SCALE

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1262	99.39	3.986	0.15	1.00	What is your name.
1267	99.39	3.986	0.07	0.57	What is this-shoe.
1254	98.78	3.288	0.14	0.60	Identify self in mirror.
1264	98.17	2.865	0.26	0.99	What is it for-pencil.
1259	96.34	2.104	0.23	0.72	What does a doggie say.
1260	94.51	1.624	0.23	0.12	What does a kittie say.
1294	94.51	1.624	0.42	0.61	What swims.
1292	92.07	1.158	0.36	0.14	What flies.
1296	91.46	1.060	0.44	0.37	What cuts.
1290	89.63	0.793	0.37	0.00	What sleeps.
1293	89.63	0.793	0.42	0.90	What bites.
1298	88.41	0.635	0.36	0.00	What shoots.
1299	75.00	-0.636	0.54	0.23	What melts.
1261	73.78	-0.728	0.53	0.55	What does a auto say.
1304	71.95	-0.863	0.51	0.19	What stings.
1301	60.98	-1.606	0.62	0.09	What boils.
1302	50.00	-2.288	0.59	0.24	What floats.
1307	39.63	-2.927	0.56	0.41	What explodes.
1300	34.76	-3.238	0.66	0.08	What sails.
1303	34.15	-3.278	0.58	0.84	What growls.
1306	22.56	-4.102	0.44	0.55	What aches.
1305	20.73	-4.250	0.53	0.52	What gallops.

TWENTY-SECOND ITEM SET--OSERETSKY TESTS OF MOTOR PROFICIENCY

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
25	19	18	14	.773	.820	.720	.743	.794	.686

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
15.88	16.03	.46

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
14	.630	.710	.540	.613	.692	.524	.864	.956	.616
50*	.859	.889	.825	.850	.880	.816			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
9.73	9.55	.80

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined
for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
19	.763	.813	.707
50*	.894	.916	.870

* Spearman-Brown reliability estimates based on 50 items.

TWENTY-SECOND ITEM SET--OSERETSKY TESTS OF MOTOR PROFICIENCY

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
1467	98.14	3.473	0.33	0.97	Strike table with mal.
1452	96.27	2.696	0.21	0.00	Hop 7 times in 5 sec.
1451	93.17	1.966	0.36	0.82	Touch nose-eyes shut.
1455	90.68	1.568	0.36	0.35	Squeeze each hand.
1464	88.82	1.325	0.38	0.74	Jump over a rope.
1461	88.20	1.251	0.37	0.37	Clench teeth.
1466	85.71	0.984	0.38	0.65	Walk and roll thread.
1458	83.85	0.806	0.54	0.49	Hop on 1 foot 5 meter.
1456	81.99	0.642	0.46	0.13	Balance on tip-toe.
1460	81.99	0.642	0.49	0.12	Put 20 matchsticks in.
1463	81.99	0.642	0.32	0.09	Throw ball at target.
1457	70.19	-0.199	0.46	0.30	Make ball with paper.
1462	70.19	-0.199	0.59	0.48	Standing on one leg.
1470	59.01	-0.849	0.57	0.74	Walk line one foot in.
1468	40.37	-1.862	0.59	0.65	Bend over while on.
1471	26.71	-2.683	0.51	0.44	Put 36 cards in 4 piles.
1459	24.84	-2.810	0.36	0.10	Roll thread on spool.
1472	20.50	-3.130	0.35	0.02	Tap floor-feet, circle.
1465	9.32	-4.263	0.43	0.10	Draw 20 perpendicular.

TWENTY-THIRD ITEM SET--PEABODY PICTURE VOCABULARY TEST

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
Initial	Retained			Disadvantaged			Advantaged		
	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
80	49	54	35	.881	.906	.853	.782	.825	.734

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
48.04	59.44	12.79

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
35	.801	.842	.755	.722	.777	.660	.914	.956	.834
50*	.852	.883	.817	.788	.830	.740			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
21.05	27.51	13.11

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
49	.835	.869	.797
50*	.838	.871	.800

* Spearman-Brown reliability estimates based on 50 items.

TWENTY-THIRD ITEM SET--PEABODY PICTURE VOCABULARY TEST

Summary of Item Analysis for Items Retained
for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
1682	99.39	4.618	0.12	1.00	Identify bus.
1687	98.17	3.486	0.33	0.93	Identify boat.
1690	98.17	3.486	0.28	0.94	Identify turtle.
1701	96.95	2.939	0.34	0.93	Identify snake.
1688	95.73	2.568	0.24	0.64	Identify children.
1700	94.51	2.284	0.34	0.94	Identify ladder.
1694	93.90	2.163	0.33	0.03	Identify jacket.
1689	93.29	2.053	0.43	0.39	Identify bell.
1692	93.29	2.053	0.29	0.06	Identify lamp.
1693	92.68	1.951	0.46	0.83	Identify sitting.
1696	92.07	1.856	0.38	0.20	Identify ring.
1704	89.63	1.530	0.35	0.37	Identify baking.
1709	87.80	1.326	0.29	0.26	Identify rat.
1691	85.98	1.146	0.42	0.30	Identify climbing.
1695	85.37	1.090	0.40	0.47	Identify pulling.
1708	84.76	1.036	0.54	0.19	Identify kite.
1705	84.15	0.983	0.46	0.74	Identify cone.
1714	83.54	0.933	0.35	0.07	Identify skiing.
1698	82.93	0.883	0.40	0.42	Identify hitting.
1703	82.32	0.835	0.47	0.53	Identify ringing.
1710	81.10	0.742	0.39	0.62	Identify time.
1706	70.12	0.048	0.40	0.03	Identify engineer.
1719	70.12	0.048	0.51	0.52	Identify parachute.
1725	65.85	-0.181	0.35	0.22	Identify balancing.
1727	65.85	-0.181	0.39	0.11	Identify pledging.
1707	60.98	-0.426	0.43	0.61	Identify peeking.
1729	59.76	-0.486	0.27	0.12	Identify hydrant.
1720	56.10	-0.661	0.42	0.12	Identify saddle.
1718	54.27	-0.748	0.48	0.68	Identify barber.
1726	50.00	-0.948	0.43	0.21	Identify cobweb.
1730	48.78	-1.005	0.41	0.54	Identify binocular.
1736	46.34	-1.119	0.40	0.65	Identify weapon.

TWENTY-THIRD ITEM SET--(Continued)

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Bas. Para.	Pt. Bis. r	Prob.	Verbal Description
1737	43.90	-1.234	0.28	0.00	Identify bannister.
1740	41.46	-1.350	0.41	0.18	Identify walrus.
1734	40.85	-1.379	0.51	0.08	Identify insect.
1733	40.24	-1.409	0.28	0.09	Identify reel.
1732	39.02	-1.468	0.36	0.39	Identify hive.
1717	38.41	-1.497	0.10	0.02	Identify wasp.
1738	38.41	-1.497	0.30	0.49	Identify idol.
1739	34.76	-1.679	0.40	0.25	Identify globe.
1749	34.15	-1.710	0.37	0.62	Identify erecting.
1744	33.54	-1.742	0.17	0.00	Identify chef.
1747	29.27	-1.969	0.26	0.05	Identify observatory.
1757	21.95	-2.404	0.24	0.03	Identify oasis.
1758	21.34	-2.445	0.15	0.06	Identify soldering.
1745	15.85	-2.848	0.18	0.10	Identify harvesting.
1746	14.63	-2.951	0.19	0.03	Identify construction.
1754	12.80	-3.118	0.18	0.28	Identify autumn.
1751	8.54	-3.602	0.28	0.49	Identify casserole.

TWENTY-FOURTH ITEM SET--LET'S LOOK AT FIRST GRADERS

STEP I--FIRST ANALYSIS
Items Retained for Disadvantaged and Advantaged Groups
and Items Retained in Common for Both Groups

Number of Items				Reliability					
	Retained			Disadvantaged			Advantaged		
Initial	Disadvantaged	Advantaged	Common	r	95% Confidence Limits		r	95% Confidence Limits	
					Upper	Lower		Upper	Lower
26	19	13	9	.833	.873	.788	.506	.605	.395

STEP 2--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
22.79	24.12	4.10

STEP 3--SECOND ANALYSIS
Disadvantaged and Advantaged Groups Separately
for Commonly Retained Items

No. of Items	Reliability						Easiness Parameters		
	Disadvantaged			Advantaged					
	r	95% Confidence Limits		r	95% Confidence Limits		r	95% Confidence Limits	
		Upper	Lower		Upper	Lower		Upper	Lower
9	.557	.703	.374	-.268	-	-	-	-	-
50 *	.875	.915	.827	-	-	-			

* Spearman-Brown reliability estimates based on 50 items.

STEP 4--Test of Differences of Raw Score Means

Disadvantaged	Advantaged	z
7.89	8.64	4.68

STEP 5--THIRD ANALYSIS
Disadvantaged and Advantaged Groups Combined
for Commonly Retained Items

NOT APPLICABLE

STEP 6--FOURTH ANALYSIS
Items Retained for Disadvantaged Group Only

No. of Items	Reliability		
	r	95% Confidence Limits	
		Upper	Lower
19	.785	.844	.715
50*	.906	.931	.876

* Spearman-Brown reliability estimates based on 50 items.

TWENTY-FOURTH ITEM SET--LET'S LOOK AT FIRST GRADERS

Summary of Item Analysis for Items Retained for Disadvantaged Group Only

I.D. Label	Diff. Level	Eas. Para.	Pt. Bis. r	Prob.	Verbal Description
471	98.89	2.991	0.40	0.89	Find pict. most like.
469	97.78	2.185	0.44	0.78	Find pict. most like.
470	96.67	1.680	0.40	0.07	Find pict. most like.
472	96.67	1.680	0.36	0.20	Find pict. most like.
474	95.56	1.307	0.41	0.14	Find pict. most like.
765	95.56	1.307	0.56	0.54	Find pict. most like.
475	94.44	1.010	0.35	0.26	Find pict. most like.
761	91.11	0.366	0.44	0.21	Find pict. most like.
749	87.78	-0.093	0.55	0.12	Find pict. most like.
763	86.67	-0.222	0.44	0.02	Find pict. most like.
750	82.22	-0.657	0.59	0.39	Find pict. most like.
764	82.22	-0.667	0.51	0.03	Find pict. most like.
752	80.00	-0.858	0.51	0.21	Find pict. most like.
759	78.89	-0.948	0.42	0.22	Find pict. most like.
751	77.78	-1.034	0.54	0.14	Find pict. most like.
760	75.56	-1.199	0.60	0.46	Find pict. most like.
753	67.78	-1.709	0.38	0.03	Find pict. most like.
754	64.44	-1.905	0.55	0.07	Find pict. most like.
762	38.89	-3.224	0.37	0.17	Find pict. most like.

Appendix K

Verbal Descriptions of all items used in the Investigation by Anchor and Battery Groupings, Tests, I. D. Label Numbers and Item Numbers in the Test

Verbal Descriptions of Anchor Items used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Stanford-Binet Intelligence Scale (1960)

I.D. Label	Verbal Description of Item	Item Number in Test
1	THREE-HOLE FORM BOARD	B2-1
2	HIDING CAT-MIDDLE BOX	B2-2 A
3	HIDING CAT-RIGHT BOX	B2-2 B
4	HIDING CAT-LEFT BOX	B2-2 C
5	IDENTIFY BODY-HAIR	B2-3 A
6	IDENTIFY BODY-MOUTH	B2-3 B
7	IDENTIFY BODY-FEET	B2-3 C
8	IDENTIFY BODY-EAR	B2-3 D
9	IDENTIFY BODY-NOSE	B2-3 E
10	IDENTIFY BODY-HANDS	B2-3 F
11	IDENTIFY BODY-EYES	B2-3 G
12	BLOCK BUILDING-TOWER	B2-4
13	PICTURE VOC. AIRPLANE	B2-5 1
14	PICTURE VOC. TELEPHONE	B2-5 2
15	PICTURE VOC. HAT	B2-5 3
16	PICTURE VOC. BALL	B2-5 4
17	PICTURE VOC. TREE	B2-5 5
18	PICTURE VOC. KEY	B2-5 6
19	PICTURE VOC. HORSE	B2-5 7
20	PICTURE VOC. KNIFE	B2-5 8
21	PICTURE VOC. COAT	B2-5 9
22	PICTURE VOC. SHIP	B2-510
23	PICTURE VOC. UMBRELLA	B2-511
24	PICTURE VOC. FOOT	B2-512
25	PICTURE VOC. FLAG	B2-513
26	PICTURE VOC. CANE	B2-514
27	PICTURE VOC. ARM	B2-515
28	PICTURE VOC. POCKET KNIFE	B2-516
29	PICTURE VOC. PITCHER	B2-517
30	PICTURE VOC. LEAF	B2-518
31	WORD COMBINATIONS	B2-6
32	POINT TO DOG	B2-A A
33	POINT TO BALL	B2-A B
34	POINT TO ENGINE	B2-A C
35	POINT TO BED	B2-A D
36	POINT TO DOLL	B2-A E
37	POINT TO SCISSORS	B2-A F
38	WHAT DRINK OUT OF-(POINT CUP)	B2-61A
39	WEAR ON FEET-(POINT SHOES)	B2-61B
40	WHAT BUY CANDY-(POINT PENNY)	B2-61C
41	WHAT CUT WITH-(POINT KNIFE)	B2-61D
42	WHAT RIDE IN-(POINT CAR)	B2-61E
43	WHAT IRON WITH-(POINT IRON)	B2-61F
44	WHAT IS THIS-CHAIR	B2-63A
45	WHAT IS THIS-AUTOMOBILE	B2-63B

Anchor Items (Cont'd.)

Stanford-Binet Intelligence Scale (1960)

I.D. Label	Verbal Description of Item	Item Number in Test
46	WHAT IS THIS-BOX	B2-63C
47	WHAT IS THIS-KEY	B2-63D
48	WHAT IS THIS-FORK	B2-63E
49	WHAT IS THIS-FLAG	B2-63F
50	REPEATING 2 DIGITS(4-7)	B2-65A
51	REPEATING 2 DIGITS(6-3)	B2-65B
52	REPEATING 2 DIGITS(5-8)	B2-65C
53	GIVE ME THE DOG	B2-66A
54	PUT BUTTON IN BOX	B2-66B
55	PUT SCISSORS BESIDE BLOCK	B2-66C
56	3-HOLE FORM BOARD-ROTATED	B2-6A
57	STRINGING BEADS	B3-1
58	BLOCK BUILDING-BRIDGE	B3-3
59	PICTURE MEMORIES-FIND COW	B3-4 A
60	PICTURE MEMORIES-FIND BIRDS	B3-4 B
61	COPYING CIRCLE	B3-5
62	DRAWING A VERTICAL LINE	B3-6
63	REPEATING DIGITS (6-4-1)	B3-A A
64	REPEATING DIGITS (3-5-2)	B3-A B
65	REPEATING DIGITS (8-3-7)	B3-A C
66	WHICH BALL IS BIGGER	B3-61
67	PUT PIECES TOGETHER-MAKE BALL	B3-62A
68	PUT PIECES TOGETHER-MAKE PIG	B3-62B
69	DISCRIMINATION OF ANIMAL PICT.	B3-63
70	RESP. TO PICT. 1-GRANNY STORY	B364A1
71	RESP. TO PICT. 2-GRANNY STORY	B364A2
72	RESP. TO PICT. 1-BIRTHDAY	B364B1
73	RESP. TO PICT. 2-BIRTHDAY	B364B2
74	RESP. TO PICT. 1-WASH DAY	B364C1
75	RESP. TO PICT. 2-WASH DAY	B364C2
76	SORTING BUTTONS	B3-65
77	WHAT DO WHEN THIRSTY	B3-66A
78	WHY WE NEED STOVES	B3-66B
79	COMPARISON OF STICKS	B3-6 A
80	WHAT HIDE UNDER BOX-DOG	B4-2 A
81	WHAT HIDE UNDER BOX-ENGINE	B4-2 B
82	WHAT HIDE UNDER BOX-DOLL	B4-2 C
83	BROTHER BOY, SISTER...	B4-3 A
84	DAYTIME LIGHT, NIGHT...	B4-3 B
85	FATHER MAN, MOTHER...	B4-3 C
86	SNAIL SLOW, RABBIT...	B4-3 D
87	SUN SHINES DAY, MOON AT...	B4-3 E
88	POINT WHAT COOK ON	B4-4 A
89	POINT WHAT CARRY IN RAIN	B4-4 B
90	POINT WHAT GIVES MILK	B4-4 C

Anchor Items (Cont'd.)

Stanford-Binet Intelligence Scale (1960)

I.D. Label	Verbal Description of Item	Item Number in Test
91	POINT WHAT HAS LONGEST EARS	B4-4 D
92	POINT WHAT SHINES SKY AT NIGHT	B4-4 E
93	POINT WHAT CATCHES MICE	B4-4 F
94	MATCHING 10 GEOMETRIC FORMS	B4-5
95	WHY DO WE HAVE HOUSES	B4-6 A
96	WHY DO WE HAVE BOOKS	B4-6 B
97	REPEAT SENTENCE 9 WORDS	B4-A A
98	REPEAT SENTENCE-10 WORDS	B4-A B
99	WHICH PRETTIER-2 GIRLS	B4-61A
100	WHICH PRETTIER-2 GIRLS	B4-61B
101	WHICH PRETTIER-2 MEN	B4-61C
102	WHICH NOT SAME	B4-63A
103	WHICH NOT SAME	B4-63B
104	WHICH NOT SAME	B4-63C
105	WHICH NOT SAME	B4-63D
106	WHICH NOT SAME	B4-63E
107	WHAT HOUSE MADE OF	B4-64A
108	WHAT WINDOW MADE OF	B4-64B
109	WHAT BOOK MADE OF	B4-64C
110	WHAT DO WITH EYES	B4-66A
111	WHAT DO WITH EARS	B4-66B
112	FINISH DRAWING MAN-LEG	B5-1 L
113	FINISH DRAWING MAN-ARMS	B5-1 A
114	FINISH DRAWING MAN-FACE	B5-1 F
115	PAPER FOLDING-TRIANGLE	B5-2
116	WHAT IS BALL	B5-3 A
117	WHAT IS HAT	B5-3 B
118	WHAT IS STOVE	B5-3 C
119	COPYING SQUARE	B5-4
120	ARE THESE 2 THE SAME	B5-5 A
121	ARE THESE 2 THE SAME	B5-5 B
122	ARE THESE 2 THE SAME	B5-5 C
123	ARE THESE 2 THE SAME	B5-5 D
124	ARE THESE 2 THE SAME	B5-5 E
125	ARE THESE 2 THE SAME	B5-5 F
126	ARE THESE 2 THE SAME	B5-5 G
127	ARE THESE 2 THE SAME	B5-5 H
128	ARE THESE 2 THE SAME	B5-5 I
129	ARE THESE 2 THE SAME	B5-5 J
130	PATIENCE RECTANGLES	B5-6
131	MAKE A KNOT	B5-A
132	HOW BIRD AND DOG NOT SAME	B6-2 A
133	HOW SLIPPER AND BOOT NOT SAME	B6-2 B
134	HOW WOOD AND GLASS NOT SAME	B6-2 C
135	WHAT IS NOT THERE ON WAGON	B6-3 A

Anchor Items (Cont'd.)

Stanford-Binet Intelligence Scale (1960)

I.D. Label	Verbal Description of Item	Item Number in Test
136	WHAT IS NOT THERE ON SHOE	B6-3 B
137	WHAT IS NOT THERE ON TEAPOT	B6-3 C
138	WHAT IS NOT THERE ON RABBIT	B6-3 D
139	WHAT IS NOT THERE ON GLOVE	B6-3 E
140	GIVE ME 3 BLOCKS	B6-4 A
141	GIVE ME 10 BLOCKS	B6-4 B
142	GIVE ME 6 BLOCKS	B6-4 C
143	GIVE ME 9 BLOCKS	B6-4 D
144	GIVE ME 7 BLOCKS	B6-4 E
145	TABLE MADE OF WOOD, WINDOW OF	B6-5 A
146	A BIRD FLIES, A FISH . . .	B6-5 B
147	CANE BLUNT, KNIFE...	B6-5 C
148	INCH SHORT, MILE...	B6-5 D
149	MAZE TRACING-BOY TO SCHOOL	B6-6 A
150	MAZE TRACING-BOY TO SCHOOL	B6-6 B
151	MAZE TRACING-BOY TO SCHOOL	B6-6 C
152	PICT. ABSURDITY-UMBRELLA	B7-1 A
153	PICT. ABSURDITY-SAWING WOOD	B7-1 B
154	PICT. ABSURDITY-DOG, RABBIT	B7-1 C
155	PICT. ABSURDITY-COUPLE IN RAIN	B7-1 D
156	PICT. ABSURDITY-CAT AND MICE	B7-1 E
157	HOW WOOD AND COAL ALIKE	B7-2 A
158	HOW APPLE AND PEACH ALIKE	B7-2 B
159	HOW SHIP AND AUTO ALIKE	B7-2 C
160	HOW IRON AND SILVER ALIKE	B7-2 D
161	COPYING A DIAMOND	B7-3
162	WHAT DO IF FIND BABY ON STREET	B7-4 A
163	WHAT DO IF BREAK SOMETHING	B7-4 B
164	WHAT DO IF LATE TO SCHOOL	B7-4 C
165	WHAT MAKES SAILBOAT MOVE	B7-4 D
166	WHAT DO IF BOY HITS YOU	B7-4 E
167	WHAT DO IF ASKED ADDRESS	B7-4 F
168	RABBITS EARS LONG-RATS EARS...	B7-5 A
169	SNOW WHITE-COAL...	B7-5 B
170	DOG HAS HAIR-BIRD HAS...	B7-5 C
171	WOLVES WILD-DOGS...	B7-5 D
172	REPEATING 5 DIGITS	B7-6 A
173	REPEATING 5 DIGITS	B7-6 B
174	REPEATING 5 DIGITS	B7-6 C
175	REPEATING 3 DIGITS REVERSED	B7-A A
176	REPEATING 3 DIGITS REVERSED	B7-A B
177	REPEATING 3 DIGITS REVERSED	B7-A C
178	DEFINE ORANGE	BVOC 1
179	DEFINE ENVELOPE	BVOC 2
180	DEFINE STRAW	BVOC 3

Anchor Items (Cont'd.)

Stanford-Binet Intelligence Scale (1960)

I.D. Label	Verbal Description of Item	Item Number in Test
181	DEFINE PUDDLE	BVOC 4
182	DEFINE TAP	BVOC 5
183	DEFINE GOWN	BVOC 6
184	DEFINE ROAR	BVOC 7
185	DEFINE EYELASH	BVOC 8
186	DEFINE MARS	BVOC 9
187	DEFINE JUGGLER	BVOC10
188	DEFINE SCORCH	BVOC11
189	DEFINE LECTURE	BVOC12
190	DEFINE SKILL	BVOC13
191	DEFINE BRUNETTE	BVOC14
192	DEFINE MUZZLE	BVOC15
193	DEFINE HASTE	BVOC16
194	DEFINE PECULIARITY	BVOC17
195	DEFINE PRICELESS	BVOC18
196	DEFINE REGARD	BVOC19
197	DEFINE TOLERATE	BVOC20
198	DEFINE DISPROPORTIONATE	BVOC21
199	DEFINE LOTUS	BVOC22
200	DEFINE SHREWD	BVOC23
201	DEFINE MOSAIC	BVOC24
202	DEFINE STAVE	BVOC25
203	DEFINE BEWAIL	BVOC26
204	DEFINE OCHRE	BVOC27
205	DEFINE REPOSE	BVOC28
206	DEFINE AMBERGRIS	BVOC29
207	DEFINE LIMPET	BVOC30
208	DEFINE FRUSTRATE	BVOC31
209	DEFINE FLAUNT	BVOC32
210	DEFINE INCRUSTATION	BVOC33
211	DEFINE RETROACTIVE	BVOC34
212	DEFINE PHILANTHROPY	BVOC35
213	DEFINE PISCATORIAL	BVOC36
214	DEFINE MILKSOP	BVOC37
215	DEFINE HARPY	BVOC38
216	DEFINE DEPREDATION	BVOC39

Anchor Items (Cont'd.)

Wechsler Preschool and Primary Scale of Intelligence (1967)

I.D. Label	Verbal Description of Item	Item Number in Test
217	POINT TO NOSE	WINF 1
218	HOW MANY EARS DO YOU HAVE	WINF 2
219	WHICH FINGER-THUMB	WINF 3
220	WHAT COMES IN BOTTLE	WINF 4
221	WHAT LIVES IN WATER	WINF 5
222	WHAT COLOR IS GRASS	WINF 6
223	NAME THREE ANIMALS	WINF 7
224	FROM WHAT ANIMAL GET MILK	WINF 8
225	WHAT SHINES IN SKY AT NIGHT	WINF 9
226	HOW MANY LEGS HAS A DOG	WINF10
227	WHAT PUT ON LETTER BEFORE MAIL	WINF11
228	WHAT NEEDED TO JOIN WOOD	WINF12
229	NAME TWO THINGS ROUND	WINF13
230	WHAT NEEDED TO MAKE WATER BOIL	WINF14
231	IN WHAT STORE BUY SUGAR	WINF15
232	HOW MANY PENNIES IN A NICKEL	WINF16
233	WHAT ARE SHOES MADE OF	WINF17
234	HOW MANY DAYS IN WEEK	WINF18
235	WHAT BREAD MADE OF	WINF19
236	NAME FOUR SEASONS	WINF20
237	WHAT COLOR RUBIES	WINF21
238	HOW MANY MAKES A DOZEN	WINF22
239	WHERE DOES SUN SET	WINF23
240	ANIMAL HOUSE	WAH 1
241	DEFINE SHOE	WVOC 1
242	DEFINE KNIFE	WVOC 2
243	DEFINE BICYCLE	WVOC 3
244	DEFINE HAT	WVOC 4
245	DEFINE UMBRELLA	WVOC 5
246	DEFINE NAIL	WVOC 6
247	DEFINE LETTER	WVOC 7
248	DEFINE GAS	WVOC 8
249	DEFINE DONKEY	WVOC 9
250	DEFINE SWING	WVOC10
251	DEFINE CASTLE	WVOC11
252	DEFINE SNAP	WVOC12
253	DEFINE FUR	WVOC13
254	DEFINE POLITE	WVOC14
255	DEFINE MOTH	WVOC15
256	DEFINE JOIN	WVOC16
257	DEFINE HERO	WVOC17
258	DEFINE DIAMOND	WVOC18
259	DEFINE CHISEL	WVOC19
260	DEFINE NUISANCE	WVOC20
261	DEFINE MICROSCOPE	WVOC21

Anchor Items (Contd.)

Wechsler Preschool and Primary Scale of Intelligence (1967)

I.D. Label	Verbal Description of Item	Item Number in Test
262	DEFINE GAMBLE	WVOC22
263	FIND WHAT MISSING-COMB-TOOTH	WPC 1
264	FIND WHAT MISSING-WAGON-WHEEL	WPC 2
265	FIND WHAT MISSING-DOLL-ARM	WPC 3
266	FIND WHAT MISSING-ROSE-STEM	WPC 4
267	FIND WHAT MISSING-GIRL-MOUTH	WPC 5
268	FIND WHAT MISSING-FOX-EAR	WPC 6
269	FIND WHAT MISSING-TABLE-LEG	WPC 7
270	FIND WHAT MISSING-SEESAW-CHILD	WPC 8
271	FIND WHAT MISSING-HAND-NAIL	WPC 9
272	FIND WHAT MISSING-CAT-WHISKERS	WPC 10
273	FIND WHAT MISSING-BRIDGE-ROAD	WPC 11
274	FIND WHAT MISSING-LINE-PIN	WPC 12
275	FIND WHAT MISSING-WATCH-HAND	WPC 13
276	FIND WHAT MISSING-SHOE-HEEL	WPC 14
277	FIND WHAT MISSING-CAR-LIGHT	WPC 15
278	FIND WHAT MISSING-SWING-KNOT	WPC 16
279	FIND WHAT MISSING-DOOR-HINGE	WPC 17
280	FIND WHAT MISSING-HOUSE-DOOR	WPC 18
281	FIND WHAT MISSING-COAT-HOLE	WPC 19
282	FIND WHAT MISSING-CARD-SPADE	WPC 20
283	FIND WHAT MISSING-ROOSTER-SPUR	WPC 21
284	WHAT MISSING-SCISSORS-SCREW	WPC 22
285	FIND WHAT MISSING-SCREW-SLOT	WPC 23
286	FIND BIGGEST BALL ON CARD	WAR 1
287	FIND LONGEST STICK ON CARD	WAR 2
288	WHICH BOX HAS MOST STARS	WAR 3
289	WHICH BOWL HAS MOST CHERRIES	WAR 4
290	HOW MANY BLOCKS-TWO	WAR 5
291	HOW MANY BLOCKS-FOUR	WAR 6
292	HOW MANY BLOCKS-NINE	WAR 7
293	LEAVE FOUR BLOCKS(NINE)	WAR 8
294	HOW MANY-APPLE CUT IN HALF	WAR 9
295	HOW MANY PENNIES-2 AND 1 MORE	WAR 10
296	HOW MANY MARBLES-3 AND LOST 1	WAR 11
297	HOW MANY DOLLS-5 AND LOST 2	WAR 12
298	HOW MANY PENNIES 4 AND 2 MORE	WAR 13
299	HOW MANY BOOKS-2 AND 3	WAR 14
300	HOW MUCH CANDY-1 AND 2 AND 2	WAR 15
301	HOW MUCH 2 APPLES COST	WAR 16
302	HOW MANY CRAYONS-2 TIMES 3	WAR 17
303	HOW MUCH 2 ORANGES COST	WAR 18
304	HOW MANY PAPERS-12 SOLD 5	WAR 19
305	HOW MANY MARBLES-8 AND 6 MORE	WAR 20
306	MAZES-TAKE CHICK TO MOTHER	WMAZ 1

Anchor Items (Cont'd.)

Wechsler Preschool and Primary Scale of Intelligence (1967)

I.D. Label	Verbal Description of Item	Item Number in Test
307	MAZES-TAKE CHICK TO MOTHER	WMAZ 2
308	MAZES-TAKE CHICK TO MOTHER	WMAZ 3
309	MAZE-TAKE BOY TO STREET	WMAZ 4
310	MAZE-FIND CORRECT PATH	WMAZ 5
311	MAZE-FIND CORRECT PATH	WMAZ 6
312	MAZE-FIND CORRECT PATH	WMAZ 7
313	MAZE-FIND CORRECT PATH	WMAZ 8
314	MAZE-FIND CORRECT PATH	WMAZ 9
315	MAZE-FIND CORRECT PATH	WMAZ10
316	DRAW CIRCLE FROM CARD	WGD 1
317	DRAW INVERTED T FROM CARD	WGD 2
318	DRAW DESIGN FROM CARD	WGD 3
319	DRAW SQUARE FROM CARD	WGD 4
320	DRAW CROSS FROM CARD	WGD 5
321	DRAW CIRCLE AND SQUARE	WGD 6
322	DRAW CIRCLE AND TRIANGLE	WGD 7
323	DRAW DIAMOND FROM CARD	WGD 8
324	DRAW DIAMOND IN BOX FROM CARD	WGD 9
325	DRAW DESIGN FROM CARD	WGD 10
326	RIDE IN TRAIN-RIDE IN...	WSIM 1
327	WEAR SHOES-WEAR...	WSIM 2
328	PLAY WITH BALL-PLAY WITH...	WSIM 3
329	DRINK OUT GLASS-DRINK OUT...	WSIM 4
330	BREAD AND MEAT ARE GOOD TO...	WSIM 5
331	WALK WITH LEGS-THROW WITH...	WSIM 6
332	WRITE WITH PENCIL-WRITE WITH..	WSIM 7
333	BOYS GROW TO MEN-GIRLS TO...	WSIM 8
334	MILK AND WATER ARE GOOD TO...	WSIM 9
335	A KNIFE AND PIECE OF GLASS...	WSIM10
336	HOW COAT AND SWEATER ALIKE	WSIM11
337	HOW PIANO AND VIOLIN ALIKE	WSIM12
338	HOW PLUM AND PEACH ALIKE	WSIM13
339	HOW PENNY AND NICKLE ALIKE	WSIM14
340	HOW BEER AND WINE ALIKE	WSIM15
341	HOW CAT AND MOUSE ALIKE	WSIM16
342	BLOCK DESIGN 3 SOLID	WBD 1
343	BLOCK DESIGN-3 SOLID	WBD 2
344	BLOCK DESIGN-2 DIAGONAL	WBD 3
345	BLOCK DESIGN-2 DIAGONAL	WBD 4
346	BLOCK DESIGN-2 SOLID-2 DIAG.	WBD 5
347	BLOCK DESIGN-2 SOLID-2 DIAG.	WBD 6
348	BLOCK DESIGN-4 DIAGONAL	WBD 7
349	BLOCK DESIGN-4 DIAGONAL	WBD 8
350	BLOCK DESIGN-4 DIAGONAL	WBD 9
351	BLOCK DESIGN-4 DIAGONAL	WBD 10

Anchor Items (Cont'd.)

Wechsler Preschool and Primary Scale of Intelligence (1967)

I.D. Label	Verbal Description of Item	Item Number in Test
352	WHY NOT PLAY WITH MATCHES	WCOM 1
353	WHY WASH FACE AND HANDS	WCOM 2
354	WHAT DO WHEN CUT FINGER	WCOM 3
355	WHY DO WE NEED CLOCKS	WCOM 4
356	WHAT DO IF LOSE FRIEND'S BALL	WCOM 5
357	WHY GO TO TOILET BEFORE BED	WCOM 6
358	WHY DO HOUSES HAVE WINDOWS	WCOM 7
359	WHY DO WE WEAR CLOTHES	WCOM 8
360	WHY DO PEOPLE HAVE TO WORK	WCOM 9
361	WHY LIGHTS BETTER THAN CANDLES	WCOM10
362	WHY SICK CHILDREN STAY HOME	WCOM11
363	WHAT DO IF GROCER HAS NO BREAD	WCOM12
364	WHAT DO IF KID STARTS FIGHT	WCOM13
365	WHY BETTER TO USE BRICK HOUSE	WCOM14
366	WHY CRIMINALS LOCKED UP	WCOM15
367	REPEAT SENTENCE-5 WORDS	WSEN 1
368	REPEAT SENTENCE-7 WORDS	WSEN 2
369	REPEAT SENTENCE-8 WORDS	WSEN 3
370	REPEAT SENTENCE-9 WORDS	WSEN 4
371	REPEAT SENTENCE-12 WORDS	WSEN 5
372	REPEAT SENTENCE-11 WORDS	WSEN 6
373	REPEAT SENTENCE-11 WORDS	WSEN 7
374	REPEAT SENTENCE-13 WORDS	WSEN 8
375	REPEAT SENTENCE-16 WORDS	WSEN 9
376	REPEAT SENTENCE-18 WORDS	WSEN10
377	IDENTIFY RED CRAYON	WCOLR1
378	IDENTIFY BLACK CRAYON	WCORL2
379	WHICH CRAYON COLOR OF SKY	WCOLR3
380	WHICH CRAYON COLOR OF NIGHT	WCORL4
381	COLOR CIRCLE YELLOW	WCOLR5
382	COLOR SQUARE PURPLE	WCOLR6
383	COLOR TRIANGLE ORANGE	WCOLR7

Verbal Descriptions of Battery I Items Used in the Investigation by Tests, I. D. Label Number, and Item Number in the Test

Caldwell Preschool Inventory

I.D. Label	Verbal Description of Item	Item Number in Test
384	WHAT IS YOUR FIRST NAME	1C-1
385	WHAT IS YOUR LAST NAME	1C-2
386	HOW OLD ARE YOU	1C-3
387	WHEN IS YOUR BIRTHDAY	1C-4
388	SHOW ME YOUR EYE	1C-5
389	SHOW ME YOUR NECK	1C-6
390	SHOW ME YOUR SHOULDER	1C-7
391	SHOW ME YOUR HEEL	1C-8
392	WHAT CALL (EAR)	1C-9
393	WHAT CALL (FINGER)	1C-10
394	WHAT CALL (KNEE)	1C-11
395	WHAT CALL (ELBOW)	1C-12
396	RAISE YOUR HAND	1C-13
397	WIGGLE	1C-14
398	HELLO VERY LOUDLY	1C-15
399	HELLO VERY SOFTLY	1C-16
400	FACE DOOR	1C-17
401	JUMP	1C-18
402	RED CAR ON BLACK BOX	1C-19
403	BLUE CAR UNDER GREEN BOX	1C-20
404	YELLOW CAR ON LITTLE BOX	1C-21
405	ONE CAR IN MIDDLE-SIZE BOX	1C-22
406	CARS ONE SIDE, BOXES OTHER SIDE	1C-23
407	3 CARS IN BIG BOX	1C-24
408	2 CARS BEHIND BOX IN MIDDLE	1C-25
409	GIVE EVERYTHING TO ME	1C-26
410	NAME CAR THAT PULLS TRAIN	1C-27
411	NAME LAST CAR ON TRAIN	1C-28
412	WHICH WAY DOES SAW GO	1C-29
413	WHICH WAY ELEVATOR	1C-30
414	WHICH WAY FERRIS WHEEL	1C-31
415	WHICH WAY PHONOGRAPH RECORD	1C-32
416	WHICH WAY WATERFALL	1C-33
417	WHEN EAT BREAKFAST	1C-34
418	TIME OF YEAR HOTTEST	1C-35
419	TIME OF YEAR COLDEST	1C-36
420	TIME OF YEAR NOW	1C-37
421	WHERE FIND LION	1C-38
422	WHERE BUY GAS	1C-39

Battery I Items (Cont'd.)

Caldwell Preschool Inventory

I.D. Label	Verbal Description of Item	Item Number in Test
423	WHO GO TO IF SICK	1C-40
424	WHERE FIND BOAT	1C-41
425	WHAT DO TO READ SOMETHING	1C-42
426	WHAT DOES DENTIST DO	1C-43A
427	WHAT DOES POLICEMAN DO	1C-44A
428	WHAT DOES TEACHER DO	1C-45A
429	WHAT DOES FATHER DO	1C-46A
430	WHAT DOES MOTHER DO	1C-47A
431	HOW MANY EYES	1C-48
432	HOW MANY NOSES	1C-49
433	HOW MANY HANDS	1C-50
434	HOW MANY TOES	1C-51
435	HOW MANY WHEELS-CAR	1C-52
436	HOW MANY WHEELS-BICYCLE	1C-53
437	HOW MANY WHEELS-TRICYCLE	1C-54
438	HOW MANY WHEELS-WHEELBARROW	1C-55
439	HOW MANY WHEELS-ROW BOAT	1C-56
440	COUNT TO 5	1C-57
441	HOW MANY CORNERS, PAPER	1C-58
442	WHICH MORE,2 AND 8 CHECKERS	1C-59
443	WHICH MORE,6 AND 6 CHECKERS	1C-60
444	WHICH MORE,2 AND 8 CHECKERS	1C-61
445	POINT TO MIDDLE ONE	1C-62
446	POINT TO FIRST ONE	1C-63
447	POINT TO LAST ONE	1C-64
448	POINT TO SECOND ONE	1C-65
449	POINT TO NEXT-TO-LAST	1C-66
450	DRAW A LINE	1C-67
451	DRAW A CIRCLE	1C-68
452	DRAW A SQUARE	1C-69
453	DRAW A TRIANGLE	1C-70
454	WHICH MOST LIKE A WHEEL	1C-71
455	WHICH MOST LIKE TENT	1C-72
456	WHICH MOST LIKE STICK	1C-73
457	BIGGER, BALL OR BICYCLE	1C-74
458	BIGGER, TREE OR FLOWER	1C-75
459	SLOWER, CAR OR BICYCLE	1C-76
460	HEAVIER, BRICK OR SHOE	1C-77
461	HEAVIER, FEATHER OR FORK	1C-78

Verbal Descriptions of Battery I Items used in the
Investigation by Tests, I.D. Label Number,
and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
462	FIND FLOWER NEAREST HER	1X213
463	WHICH PLANE FARTHEST AWAY	1X214
464	WHICH FISH NEAREST HIM	1X215
465	WHICH THING FARTHEST AWAY	1X216
466	FIND A WHEEL FOR WAGON	1X218
467	FIND BIRD FIT THROUGH DOOR	1X219
468	FIND MOUSE FIT INTO HOLE	1X2110
469	FIND PICT. MOST LIKE CIRCLE	1X113
470	FIND PICT. MOST LIKE CIRCLE	1X114
471	FIND PICT. MOST LIKE SQUARE	1X115
472	FIND PICT. MOST LIKE TRIANGLE	1X116
473	FIND PICT. MOST LIKE C	1X117
474	FIND PICT. MOST LIKE V	1X118
475	FIND PICT. MOST LIKE SQUARE	1X119
476	FIND PICT. MOST LIKE TRIANGLE	1X1110
477	FIND PICT. OF THING IN STORY	1X513
478	FIND PICT. OF THING IN STORY	1X514
479	FIND PICT. OF THING IN STORY	1X515
480	FIND PICT. OF THING IN STORY	1X516
481	FIND SHOE WITH HOLE, NO LACES	1X519
482	FIND APPLE WITH STEM, NO LEAF	1X5110
483	FIND COAT WITH BUTTONS, POCKET	1X5111
484	WHICH APPLE REACH GROUND FIRST	1X323
485	WHICH BALL REACH BOTTOM FIRST	1X324
486	WHICH BOOK REACH FLOOR FIRST	1X325
487	WHICH BALL REACH FLOOR FIRST	1X326
488	WHICH BIRD REACH NEST FIRST	1X327
489	WHICH BOY REACH BALL FIRST	1X328
490	WHICH TURTLE REACH POND FIRST	1X329
491	WHICH MOUSE REACH CHEESE FIRST	1X3210

Verbal Descriptions of Battery I Items used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Marianne Frostig Developmental Test of Visual Perception

I.D. Label	Verbal Description of Item	Item Number in Test
492	DRAW LINE FROM MOUSE TO COOKIE	1F1A 1
493	CRAW LINE FROM HOUSE TO HOUSE	1F1A 2
494	DRAW LINE FROM TREE TO TREE	1F1A 3
495	DRAW LINE FROM CAR TO CAR	1F1A 4
496	DRAW LINE FROM GIRL TO GIRL	1F1A 5
497	DRAW LINE BETWEEN CURVED ROAD	1F1B 6
498	DRAW LINE BETWEEN WINDING ROAD	1F1B 7
499	DRAW LINE BETWEEN CROOKED ROAD	1F1B 8
500	COVER BLACK LINE WITH PENCIL	1F1B 9
501	FRAW LINE FROM DOT TO DOT	1F1C10
502	DRAW LINE FROM STAR TO STAR	1F1C11
503	DRAW LINE FROM PEAR TO PEAR	1F1D12
504	DRAW LINE FROM TREE TO TREE	1F1D13
505	DRAW LINE FROM DOT TO DOT	1F1E14
506	DRAW LINE FROM DOT, DOT, DOT	1F1E15

Verbal Descriptions of Battery I Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Marianne Frostig Developmental Test of Visual Perception

I.D. Label	Verbal Description of Item	Item Number in Test
507	DRAW LINE FROM DOT, DOT, DOT	1F1E16
508	OUTLINE TRIANGLE	1F2A 1
509	OUTLINE RECTANGLE	1F2A 2
510	OUTLINE CROSS	JF2A 3
511	OUTLINE MOON	1F2A 4
512	OUTLINE 2 STARS	1F2B 5
513	OUTLINE 4 STARS	1F2B 6
514	OUTLINE KITES	1F2B 7
515	OUTLINE EASTER EGGS	1F2B 8
516	OUTLINE CIRCLE	1F3A 1
517	OUTLINE CIRCLE	1F3A 2
518	OUTLINE SQUARE	1F3A 3
519	OUTLINE SQUARE	1F3A 4
520	OUTLINE CIRCLE	1F3A 5
521	HEXAGON NOT OUTLINED	1F3A 6
522	HEXAGON NOT OUTLINED	1F3A 7
523	ELIPSE NOT OUTLINED	1F3A 8
524	ELIPSE NOT OUTLINED	1F3A 9
525	OUTLINE SQUARE	1F3A10
526	OUTLINE CIRCLE	1F3A11
527	PENTAGON NOT OUTLINED	1F3A12
528	OUTLINE SQUARE	1F3A13
529	OUTLINE SQUARE	1F3A14
530	PENTAGON NOT OUTLINED	1F3B 1
531	OUTLINE SQUARE	1F3B 2
532	DIAMOND NOT OUTLINED	1F3B 3
533	PARALLELOGRAM NOT OUTLINED	1F3B 4
534	OUTLINE SQUARE	1F3B 5
535	SEMI-CIRCLE NOT OUTLINED	1F3B 6
536	PARALLELOGRAM NOT OUTLINED	1F3B 7
537	FIGURE NOT OUTLINED	1F3B 8
538	OUTLINE SQUARE	1F3B 9
539	RECTANGLE NOT OUTLINED	1F3B10
540	RECTANGLE NOT OUTLINED	1F3B11
541	OUTLINE SQUARE	1F3B12
542	FIGURE NOT OUTLINED	1F3B13
543	OUTLINE SQUARE	1F3B14
544	OUTLINE SQUARE	1F3B15
545	RECTANGLE NOT OUTLINED	1F3B16
546	OUTLINE CIRCLE	1F3B17
547	OUTLINE CIRCLE	1F3B18
548	POINT TO TABLE NOT SAME	1F4A 1
549	POINT TO CHAIR NOT SAME	1F4A 2
550	POINT TO MOON NOT SAME	1F4A 3
551	POINT TO LADDER NOT SAME	1F4A 4

Battery I Items (Cont'd.)

Marianne Frostig Developmental Test of Visual Perception

I.D. Label	Verbal Description of Item	Item Number in Test
552	COPY LINES JOINING DOTS	1F4B 5
553	COPY LINES JOINING DOTS	1F4B 6
554	COPY LINES JOINING DOTS	1F4B 7
555	COPY LINES JOINING DOTS	1F4B 8
556	COPY LINES JOINING DOTS	1F5A 1
557	COPY LINES JOINING DOTS	1F5A 2
558	COPY LINES JOINING DOTS	1F5B 3
559	COPY LINES JOINING DOTS	1F5B 4
560	COPY LINES JOINING DOTS	1F5C 5
561	COPY LINES JOINING DOTS	1F5C 6
562	COPY LINES JOINING DOTS	1F5D 7
563	COPY LINES JOINING DOTS	1F5E 8

Verbal Descriptions of Battery I Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Primary Mental Abilities Spatial Relations

I.D. Label	Verbal Description of Item	Item Number in Test
564	POINT TO CROWN	1SA3A
565	POINT TO SPEAR	1SA3B
566	POINT TO DOME	1SA3C
567	POINT TO SWAN	1SA3D
568	POINT TO BEAST	1SA3E
569	POINT TO ARTIST	1SA3F
570	POINT TO BOTTLE CAP	1SA3G
571	POINT TO FASTEST WAY SEND MAIL	1SA4A
572	POINT TO WHAT WAKES FARMER	1SA4B
573	POINT TO WHAT HELPS ONE TO SEE	1SA4C
574	POINT TO WHAT FLIES, NO WINGS	1SA4D
575	POINT TO BRAVERY AWARD	1SA4E
576	POINT TO WHAT WEAR FOR WARMTH	1SA4F
577	POINT TO THING THAT KILLS BIRD	1SA4G
578	SHEETS AND BLANKET GO ON WHAT	1SA5A
579	WHAT HELP YOU SEE AFTER DARK	1SA5B
580	WHICH USED TO HANG CLOTHES	1SA5C
581	WHICH TELLS HOW COLD OUTSIDE	1SA5D
582	WHICH GROWS FOOD WE EAT	1SA5E
583	WHICH ANIMAL LIVES ON FARM	1SA5F
584	WHICH FOOD GROWS UNDERGROUND	1SA5G
585	WHICH KEEP INSIDE HOUSE DRY	1SA6A
586	WHICH ASK FOR HELP	1SA6B
587	WHICH USE TO REACH A BOOK	1SA6C
588	WHICH USE ONLY IN WINTER	1SA6D
589	WHICH NEEDED FOR WRITING	1SA6E
590	WHICH HAS ENGINEER, CONDUCTOR	1SA6F
591	WHERE CHANGE KEPT	1SA6G
592	WHAT USED TO SHARPEN SAW	1SA7A
593	MOUSE CAUGHT BY WHAT	1SA7B
594	TO TALK FAR AWAY, USE WHAT	1SA7C
595	FIND JACK CARRYING BOOK	1SA7D
596	FIND 2 MEN CARRYING LOG	1SA7E
597	FIND FATHER RESTING	1SA7F
598	FIND BIRD ON BRANCH	1SA7G
599	FIND JOE HAULING LEAVES	1SA8A
600	FIND JOE BOUNCING BALL	1SA8B
601	FIND SALLY TRYING ON DRESS	1SA8C
602	FIND SCHOOL CHILDREN RUNNING	1SA8D
603	FIND JEAN IN BACKSEAT OF CAR	1SA8E
604	FIND WHAT SEE AT ACCIDENT	1SA8F
605	FIND WHAT GIVE ONE WHO READS	1SA8G
606	FIND PICT. OF THING IN STORY	1SA9A
607	FIND PICT. OF THING IN STORY	1SA9B

Battery I Items (Cont'd.)

Primary Mental Abilities Spatial Relations

I.D. Label	Verbal Description of Item	Item Number in Test
608	FIND PICT. OF THING IN STORY	1SA9C
609	FIND PICT. OF THING IN STORY	1SA9D
610	FIND PICT. OF THING IN STORY	1SA9E
611	FIND PICT. OF THING IN STORY	1SA9F
612	FIND PICT. OF THING IN STORY	1SA9G
613	FIND DUCK LIKE THIS ONE	1SA11A
614	FIND LEAF LIKE THIS ONE	1SA11B
615	FIND DRESS LIKE THIS ONE	1SA11C
616	FIND TURKEY LIKE THIS ONE	1SA11D
617	FIND CAT LIKE THIS ONE	1SA11E
618	FIND VALENTINE LIKE THIS ONE	1SA11F
619	FIND CAMEL LIKE THIS ONE	1SA11G
620	FIND MONKEY LIKE THIS ONE	1SA12A
621	FIND SOLDIER LIKE THIS ONE	1SA12B
622	FIND FLOWER LIKE THIS ONE	1SA12C
623	FIND BIRD LIKE THIS ONE	1SA12D
624	FIND TREE LIKE THIS ONE	1SA12E
625	FIND DOG LIKE THIS ONE	1SA12F
626	FIND SHAPE LIKE THIS ONE	1SA12G
627	FIND FACE LIKE THIS ONE	1SA13A
628	FIND HORSE LIKE THIS ONE	1SA13B
629	FIND DUCK LIKE THIS ONE	1SA13C
630	FIND BOAT LIKE THIS ONE	1SA13D
631	FIND RABBIT LIKE THIS ONE	1SA13E
632	FIND FLOWER LIKE THIS ONE	1SA13F
633	FIND FISH LIKE THIS ONE	1SA13G
634	FIND SHAPE LIKE THIS ONE	1SA14A
635	FIND SHAPE LIKE THIS ONE	1SA14B
636	FIND SHAPE LIKE THIS ONE	1SA14C
637	FIND SHAPE LIKE THIS ONE	1SA14D
638	FIND SHAPE LIKE THIS ONE	1SA14E
639	FIND SHAPE LIKE THIS ONE	1SA14F
640	FIND SHAPE LIKE THIS ONE	1SA14G
641	POINT TO 3 SCISSORS	1SA16A
642	POINT TO 6 SPRINKLING CANS	1SA16B
643	POINT TO 13 LAMPS	1SA16C
644	POINT TO 5 CUPS	1SA16D
645	POINT TO 4 ELEPHANTS	1SA16E
646	POINT TO 11 KEYS	1SA16F
647	POINT TO 7 CHICKENS	1SA16G
648	POINT TO 8 SNOWMEN	1SA16H
649	POINT TO 15 SOLDIERS	1SA16I
650	POINT TO FIRST AND LAST FISH	1SA17A
651	POINT TO MOST FORKS	1SA17B
652	POINT TO NEXT-TO-LAST FLOWER	1SA17C
653	POINT TO ALL BUT 3 MOPS	1SA17D

Battery I Items (Cont'd.)

Primary Mental Abilities Spatial Relations

I.D. Label	Verbal Description of Item	Item Number in Test
654	POINT TO THIRD TEAKETTLE	1SA17E
655	POINT TO GREATEST NO. OF TREES	1SA17F
656	POINT TO ALL BUT SECOND GOAT	1SA17G
657	POINT TO CENTER LANTERN	1SA17H
658	POINT TO HALF THE GIRAFFES	1SA17I
659	HOW MANY SHOVELS 2 NEED TO DIG	1SA18A
660	HOW MANY LEFT IF TWO LEAVE	1SA18B
661	HOW MANY ARE 1 AND 2 AND 2	1SA18C
662	HOW MANY ARE 2 AND 3	1SA18D
663	HOW MANY ARE 4 AND 1	1SA18E
664	HOW MANY IS 3 TIMES 2	1SA18F
665	HOW MANY IS 11 MINUS 4	1SA18G
666	HOW MANY IS 1 AND 4	1SA18H
667	HOW MANY IS 18 MINUS 6	1SA18I
668	WHICH PICT. COMPLETES SQUARE	1SA19F
669	WHICH PICT. COMPLETES SQUARE	1SA19G
670	WHICH PICT. COMPLETES SQUARE	1SA19H
671	WHICH PICT. COMPLETES SQUARE	1SA20A
672	WHICH PICT. COMPLETES SQUARE	1SA20B
673	WHICH PICT. COMPLETES SQUARE	1SA20C
674	WHICH PICT. COMPLETES SQUARE	1SA20D
675	WHICH PICT. COMPLETES SQUARE	1SA20E
676	WHICH PICT. COMPLETES SQUARE	1SA20F
677	WHICH PICT. COMPLETES SQUARE	1SA20G
678	WHICH PICT. COMPLETES SQUARE	1SA20H
679	WHICH PICT. COMPLETES SQUARE	1SA20I
680	MAKE PICT. LIKE TEACHERS	1SA22A
681	MAKE PICT. LIKE TEACHERS	1SA22B
682	MAKE PICT. LIKE TEACHERS	1SA22C
683	MAKE PICT. LIKE TEACHERS	1SA22D
684	MAKE PICT. LIKE TEACHERS	1SA22E
685	MAKE PICT. LIKE TEACHERS	1SA22F
686	MAKE PICT. LIKE TEACHERS	1SA23A
687	MAKE PICT. LIKE TEACHERS	1SA23B
688	MAKE PICT. LIKE TEACHERS	1SA23C
689	MAKE PICT. LIKE TEACHERS	1SA23D
690	MAKE PICT. LIKE TEACHERS	1SA23E
691	MAKE PICT. LIKE TEACHERS	1SA23F

Verbal Descriptions of Battery I Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Columbia Mental Maturity Scale

I.D. Label	Verbal Description of Item	Item Number in Test
692	WHICH DOES NOT BELONG	1COL4
693	WHICH DOES NOT BELONG	1COL5
694	WHICH DOES NOT BELONG	1COL6
695	WHICH DOES NOT BELONG	1COL7
696	WHICH DOES NOT BELONG	1COL8
697	WHICH DOES NOT BELONG	1COL9
698	WHICH DOES NOT BELONG	1COL10
699	WHICH DOES NOT BELONG	1COL11
700	WHICH DOES NOT BELONG	1COL12
701	WHICH DOES NOT BELONG	1COL13
702	WHICH DOES NOT BELONG	1COL14
703	WHICH DOES NOT BELONG	1COL15
704	WHICH DOES NOT BELONG	1COL16
705	WHICH DOES NOT BELONG	1COL17
706	WHICH DOES NOT BELONG	1COL18
707	WHICH DOES NOT BELONG	1COL19
708	WHICH DOES NOT BELONG	1COL20
709	WHICH DOES NOT BELONG	1COL21
710	WHICH DOES NOT BELONG	1COL22
711	WHICH DOES NOT BELONG	1COL23
712	WHICH DOES NOT BELONG	1COL24
713	WHICH DOES NOT BELONG	1COL25
714	WHICH DOES NOT BELONG	1COL26
715	WHICH DOES NOT BELONG	1COL27
716	WHICH DOES NOT BELONG	1COL28
717	WHICH DOES NOT BELONG	1COL29
718	WHICH DOES NOT BELONG	1COL30
719	WHICH DOES NOT BELONG	1COL31
720	WHICH DOES NOT BELONG	1COL32
721	WHICH DOES NOT BELONG	1COL33
722	WHICH DOES NOT BELONG	1COL34
723	WHICH DOES NOT BELONG	1COL35
724	WHICH DOES NOT BELONG	1COL36
725	WHICH DOES NOT BELONG	1COL37
726	WHICH DOES NOT BELONG	1COL38
727	WHICH DOES NOT BELONG	1COL39
728	WHICH DOES NOT BELONG	1COL40
729	WHICH DOES NOT BELONG	1COL41
730	WHICH DOES NOT BELONG	1COL42
731	WHICH DOES NOT BELONG	1COL43
732	WHICH DOES NOT BELONG	1COL44
733	WHICH DOES NOT BELONG	1COL45
734	WHICH DOES NOT BELONG	1COL46
735	WHICH DOES NOT BELONG	1COL47

Battery I Items (Cont'd.)

Columbia Mental Maturity Scale

I.D. Label	Verbal Description of Item	Item Number in Test
736	WHICH DOES NOT BELONG	1COL48
737	WHICH DOES NOT BELONG	1COL49
738	WHICH DOES NOT BELONG	1COL50
739	WHICH DOES NOT BELONG	1COL51
740	WHICH DOES NOT BELONG	1COL52
741	WHICH DOES NOT BELONG	1COL53
742	WHICH DOES NOT BELONG	1COL54
743	WHICH DOES NOT BELONG	1COL55
744	WHICH DOES NOT BELONG	1COL56
745	WHICH DOES NOT BELONG	1COL57
746	WHICH DOES NOT BELONG	1COL58
747	WHICH DOES NOT BELONG	1COL59
748	WHICH DOES NOT BELONG	1COL60

Verbal Descriptions of Battery I Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
749	FIND PICT. MOST LIKE CIRCLE	1Y133
750	FIND PICT. MOST LIKE SQUARE	1Y134
751	FIND PICT. MOST LIKE SQUARE	1Y135
752	FIND PICT. MOST LIKE SQUARE	1Y136
753	FIND PICT. MOST LIKE SQUARE	1Y137
754	FIND PICT. MOST LIKE SQUARE	1Y138
755	FIND PICT. MOST LIKE SQUARE	1Y139
756	FIND PICT. MOST LIKE SQUARE	1Y1310
757	FIND PICT. MOST LIKE BIG ONE	1Y153
758	FIND PICT. MOST LIKE BIG ONE	1Y154
759	FIND PICT. MOST LIKE BIG ONE	1Y155
760	FIND PICT. MOST LIKE BIG ONE	1Y156
761	FIND PICT. MOST LIKE BIG ONE	1Y157
762	FIND PICT. MOST LIKE BIG ONE	1Y158
763	FIND PICT. MOST LIKE BIG ONE	1Y159
764	FIND PICT. MOST LIKE BIG ONE	1Y1510
765	FIND PICT. MOST LIKE BIG ONE	1Y1511
766	FIND PICT. MOST LIKE BIG ONE	1Y1512
767	FIND THE YOUNGEST	1Y342
768	FIND THE OLDEST	1Y343
769	WHO IS THE YOUNGEST	1Y344
770	FIND THE OLDEST CAT	1Y345
771	FIND TOY OF YOUNGEST	1Y346
772	FIND BIKE OF YOUNGEST	1Y347
773	WHICH BALLOON REACH TOP FIRST	1Y348
774	WHICH ANT REACH GROUND FIRST	1Y349
775	WHICH MAN REACH FIRE FIRST	1Y3410
776	WHICH BOY REACH GROUND FIRST	1Y3411
777	FIND PICT. IN STORY	1Y552
778	FIND PICT. IN STORY	1Y553
779	FIND PICT. IN STORY	1Y554
780	FIND PICT. IN STORY	1Y555
781	FIND PICT. IN STORY	1Y556
782	FIND PICT. IN STORY	1Y557
783	FIND PICT. IN STORY	1Y558
784	FIND CUP WITH STRAW, NO HANDLE	1Y5510
785	FIND WAGON WITH FOOD,HANDLE	1Y5511
786	FIND MAN WITH GLASSES, NO BAG	1Y5512

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

The Raven Coloured Progressive Matrixes

I.D. Label	Verbal Description of Item	Item Number in Test
787	FIND PIECE TO COMPLETE PATTERN	2R A2
788	FIND PIECE TO COMPLETE PATTERN	2R A3
789	FIND PIECE TO COMPLETE PATTERN	2R A4
790	FIND PIECE TO COMPLETE PATTERN	2R A5
791	FIND PIECE TO COMPLETE PATTERN	2R A6
792	FIND PIECE TO COMPLETE PATTERN	2R A7
793	FIND PIECE TO COMPLETE PATTERN	2R A8
794	FIND PIECE TO COMPLETE PATTERN	2R A9
795	FIND PIECE TO COMPLETE PATTERN	2R A10
796	FIND PIECE TO COMPLETE PATTERN	2R A11
797	FIND PIECE TO COMPLETE PATTERN	2R A12
798	FIND PIECE TO COMPLETE PATTERN	2R AB1
799	FIND PIECE TO COMPLETE PATTERN	2R AB2
800	FIND PIECE TO COMPLETE PATTERN	2R AB3
801	FIND PIECE TO COMPLETE PATTERN	2R AB4
802	FIND PIECE TO COMPLETE PATTERN	2R AB5
803	FIND PIECE TO COMPLETE PATTERN	2R AB6
804	FIND PIECE TO COMPLETE PATTERN	2R AB7
805	FIND PIECE TO COMPLETE PATTERN	2R AB8
806	FIND PIECE TO COMPLETE PATTERN	2R AB9
807	FIND PIECE TO COMPLETE PATTERN	2RAB10
808	FIND PIECE TO COMPLETE PATTERN	2RAB11
809	FIND PIECE TO COMPLETE PATTERN	2RAB12
810	FIND PIECE TO COMPLETE PATTERN	2R B1
811	FIND PIECE TO COMPLETE PATTERN	2R B2
812	FIND PIECE TO COMPLETE PATTERN	2R B3
813	FIND PIECE TO COMPLETE PATTERN	2R B4
814	FIND PIECE TO COMPLETE PATTERN	2R B5
815	FIND PIECE TO COMPLETE PATTERN	2R B6
816	FIND PIECE TO COMPLETE PATTERN	2R B7
817	FIND PIECE TO COMPLETE PATTERN	2R B8
818	FIND PIECE TO COMPLETE PATTERN	2R B9
819	FIND PIECE TO COMPLETE PATTERN	2R B10
820	FIND PIECE TO COMPLETE PATTERN	2R B11
821	FIND PIECE TO COMPLETE PATTERN	2R B12

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
822	SAME APPLE CUT IN HALF	2X413
823	SAME SANDWICH CUT IN HALF	2X414
824	SAME COOKIE BROKEN IN PIECES	2X415
825	SAME PAPER ROLLED UP	2X416
826	SAME PAPER FOLDED	2X417
827	SAME PIE CUT IN HALF	2X418
828	SAME EGG CUT IN HALF	2X419
829	WHAT BELONGS TO SAME GROUP	2X623
830	WHAT BELONGS TO SAME GROUP	2X624
831	WHAT BELONGS TO SAME GROUP	2X625
832	WHAT BELONGS TO SAME GROUP	2X626
833	WHAT BELONGS TO SAME GROUP	2X627
834	WHAT ELSE YOU CARRY THINGS IN	2X6210
835	WHAT ELSE SLIDES ON ICE	2X6211
836	WHAT ELSE YOU PUT WATER IN	2X6212
837	WHICH BLOCK COMPLETES SQUARE	2X223
838	WHICH BLOCK COMPLETES SQUARE	2X224
839	WHICH BLOCK COMPLETES SQUARE	2X225
840	WHICH BLOCK COMPLETES SQUARE	2X226
841	WHICH BLOCK COMPLETES SQUARE	2X227
842	WHICH BLOCK COMPLETES SQUARE	2X228
843	WHICH PITCHER SAME SIZE	2X2210
844	WHICH JAR SAME SIZE	2X2211
845	WHICH BLOCKS MAKE ROWS MATCH	2X433
846	WHICH BLOCKS MATCH 1ST PICTURE	2X434
847	WHICH APPLES FOR EMPTY PLATES	2X435
848	WHICH CUPS FOR EACH BOY	2X436
849	FIRST BOY IN THE LINE	2X439
850	SECOND ONE IN THE LINE	2X4310
851	WHICH BALL COMES OUT FIRST	2X4311
852	WHICH RING COMES OFF LAST	2X4312

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Illinois Test of Psycholinguistic Ability

I.D. Label	Verbal Description of Item	Item Number in Test
853	HERE APPLE, HERE TWO...	2IAV1
854	HERE HAT, HERE TWO...	2IAV2
855	MAN LIKES TO EAT,HERE HE IS...	2IAV3
856	HERE DRESS, HERE TWO...	2IAV4
857	MAN OPENING CAN,CAN HAS BEEN..	2IAV5
858	MAN GOING TO WRECK,NOW CAR IS.	2IAV6
859	STICK IS LONG, THIS STICK EVEN	2IAV7
860	BOX IS BIG,THIS BOX IS EVEN...	2IAV8
861	POTATOES ARE BIG,THIS ONE EVEN	2IAV9
862	MAN IS PAINTING, HE IS A...	2IAV10
863	LADY WRITING, HERE LETTER SHE.	2IAV11
864	HE HAS MANY PIPES,HE HAS EVEN.	2IAV12
865	HERE MAN, HERE TWO...	2IAV13
866	LADY POLISHING, POT HAS BEEN..	2IAV14
867	HERE LEAF, HERE TWO...	2IAV15
868	HERE KNIFE, HERE TWO...	2IAV16
869	MAN HANGING PICTURE,ITS BEEN..	2IAV17
870	CAKE LOOKS GOOD,THIS ONE LOOKS	2IAV18
871	PENCILS LOOK GOOD,THIS ONE IS.	2IAV19
872	HERE THIEF, HERE ARE TWO...	2IAV20
873	HERE MOUSE, HERE TWO...	2IAV21
874	THIEF STEALING,THESE JEWELS HE	2IAV22
875	SEE BOAT, FIND ONE HERE	2IVD1
876	SEE PENCIL, FIND ONE HERE	2IVD2
877	SEE DOLL, FIND ONE HERE	2IVD3
878	SEE CHAIR, FIND ONE HERE	2IVD4
879	SEE BINOCULARS, FIND ONE HERE	2IVD5
880	SEE KNIFE, FIND ONE HERE	2IVD6
881	SEE SAW, FIND ONE HERE	2IVD7
882	SEE FAUCET, FIND ONE HERE	2IVD8
883	SEE GOGGLES, FIND ONE HERE	2IVD9
884	SEE TRAIN, FIND ONE HERE	2IVD10
885	SEE NAIL, FIND ONE HERE	2IVD11
886	SEE ICE SKATE, FIND ONE HERE	2IVD12
887	SEE VEST, FIND ONE HERE	2IVD13
888	SEE PROJECTOR, FIND ONE HERE	2IVD14
889	SEE PEN, FIND ONE HERE	2IVD15
890	SEE PUMP, FIND ONE HERE	2IVD16
891	SEE LETTERS, FIND SAME HERE	2IVD17
892	SEE HOOK, FIND ONE HERE	2IVD18
893	SEE DIPLOMA, FIND ONE HERE	2IVD19
894	SEE SPATULA, FIND ONE HERE	2IVD20
895	SEE JACK, FIND ONE HERE	2IVD21
896	SEE COMPASS, FIND ONE HERE	2IVD22
897	SEE GRAPH, FIND ONE HERE	2IVD23
898	SEE SCREWDRIVER, FIND ONE HERE	2IVD24

Battery II Items (Cont'd.)

Illinois Test of Psycholinguistic Ability

I.D. Label	Verbal Description of Item	Item Number in Test
899	SHOW WHAT YOU DO WITH GUN	2IM 1
900	SHOW WHAT YOU DO WITH PITCHER	2IM 2
901	SHOW USE OF PENCIL SHARPENER	2IM 3
902	SHOW USE OF TROMBONE-BLOWS IT	2IM 4A
903	SHOW USE OF TROMBONE-SLIDES IT	2IM 4B
904	SHOW USE OF DRILL	2IM 5
905	SHOW USE OF PHONE-DIALS	2IM 6A
906	SHOW USE OF PHONE-RECEIVER-EAR	2IM 6B
907	SHOW USE OF SAFE	2IM 7
908	SHOW USE OF DOOR KNOB-TURN IT	2IM 8A
909	SHOW USE OF DOOR KNOB-PULLS IT	2IM 8B
910	SHOW USE OF SAW-BACK AND FORTH	2IM 9A
911	SHOW USE OF SAW-HOLDS BOARD	2IM 9B
912	SHOW USE OF BINOCULARS-HANDS	2IM10A
913	SHOW USE OF BINOCULARS-TURNS	2IM10B
914	SHOW USE OF FUNNEL-POURS INTO	2IM11A
915	SHOW USE OF FUNNEL-CUPS HAND	2IM11B
916	SHOW USE OF STETHESCOPE	2IM12
917	SHOW USE OF SAXOPHONE	2IM13
918	SHOW USE OF GUITAR-HOLDS,STRUM	2IM14A
919	SHOW USE OF GUITAR-FINGERS	2IM14B
920	SHOW USE OF FLUTE-HOLDS RIGHT	2IM15A
921	SHOW USE OF FLUTE-BLOWS	2IM15B
922	SHOW USE OF FLUTE-FINGERS	2IM15C
923	SHOW USE OF VIOLIN-FINGERS	2IM16A
924	SHOW USE OF VIOLIN-ARM,BOWS	2IM16B
925	SHOW USE OF VIOLIN-CHIN	2IM16C
926	SIT ON CHAIR, SLEEP ON...	2IAV1
927	EAT FROM PLATE, DRINK FROM...	2IAV2
928	BIRD FLIES IN AIR,FISH SWIMS..	2IAV3
929	HIT WITH HAND, KICK WITH...	2IAV4
930	JOHN IS BOY, MARY IS...	2IAV5
931	SCISSOR CUTS, PENCIL...	2IAV6
932	CUT WITH SAW, POUND WITH	2IAV7
933	SOUP IS HOT, ICE CREAM IS...	2IAV8
934	RED LIGHT-STOP, GREEN LIGHT...	2IAV9
935	DAY-WE AWAKE, NIGHT WE...	2IAV10
936	EAT WITH SPOON, CUT WITH...	2IAV11
937	HANDS HAVE FINGERS,FEET HAVE..	2IAV12
938	BOY RUNS, OLD MAN...	2IAV13
939	COTTON IS SOFT,STONES ARE...	2IAV14
940	EXPLOSION IS LOUD,WHISPER IS..	2IAV15
941	MTS. ARE HIGH, VALLEYS ARE...	2IAV16
942	MAN IS A KING, WOMAN IS A	2IAV17
943	PICKLE IS FAT, PENCIL IS..	2IAV18
944	COFFEE IS BITTER, SUGAR IS...	2IAV19
945	IRON IS HEAVY, FEATHERS ARE ..	2IAV20

Battery II Items (Cont'd.)

Illinois Test of Psycholinguistic Ability

I.D. Label	Verbal Description of Item	Item Number in Test
946	PENNY IS ROUND, RULER IS...	2IAV21
947	RABBIT IS SWIFT, TURTLE IS...	2IAV22
948	SANDPAPER IS ROUGH, GLASS IS..	2IAV23
949	THREL IS ODD NUMBER, SIX IS...	2IAV24
950	CUBE IS SQUARE, SPHERE IS ...	2IAV25
951	OCEAN IS DEEP, POND IS...	2IAV26
952	REPEAT 2 DIGITS	2IVS1
953	REPEAT 2 DIGITS	2IVS2
954	REPEAT 3 DIGITS	2IVS3
955	REPEAT 3 DIGITS	2IVS4
956	REPEAT 3 DIGITS	2IVS5
957	REPEAT 3 DIGITS	2IVS6
958	REPEAT 4 DIGITS	2IVS7
959	REPEAT 4 DIGITS	2IVS8
960	REPEAT 4 DIGITS	2IVS9
961	REPEAT 4 DIGITS	2IVS10
962	REPEAT 5 DIGITS	2IVS11
963	REPEAT 5 DIGITS	2IVS12
964	REPEAT 5 DIGITS	2IVS13
965	REPEAT 6 DIGITS	2IVS14
966	REPEAT 6 DIGITS	2IVS15
967	REPEAT 6 DIGITS	2IVS16
968	REPEAT 6 DIGITS	2IVS17
969	REPEAT 7 DIGITS	2IVS18
970	REPEAT 7 DIGITS	2IVS19
971	REPEAT 7 DIGITS	2IVS20
972	WHICH ONE GOES WITH SCRATCHPAD	2IVM1
973	WHICH ONE GOES WITH NAIL	2IVM2
974	WHICH ONE GOES WITH NAIL	2IVM3
975	WHICH ONE GOES WITH NEEDLE	2IVM4
976	WHICH ONE GOES WITH HAND	2IVM5
977	WHICH ONE GOES WITH BABY	2IVM6
978	WHICH ONE GOES WITH HORSE	2IVM7
979	WHICH ONE GOES WITH HAMMER	2IVM8
980	WHICH ONE GOES WITH BREAD	2IVM9
981	WHICH ONE GOES WITH LAMP	2IVM10
982	WHICH ONE GOES WITH BIRD	2IVM11
983	WHICH ONE GOES WITH GIRL	2IVM12
984	WHICH ONE GOES WITH LADY	2IVM13
985	WHICH ONE GOES WITH DRUM	2IVM14
986	WHICH ONE GOES WITH BED	2IVM15
987	WHICH ONE GOES WITH WINDOW	2IVM16
988	WHICH ONE GOES WITH JAR	2IVM17
989	WHICH ONE GOES WITH INNERTUBE	2IVM18
990	WHICH ONE GOES WITH SQUARE	2IVM19
991	WHICH ONE GOES WITH STOVE	2IVM20
992	WHICH ONE GOES WITH SCREWDRIVR	2IVM21

Battery II Items (Cont'd.)

Illinois Test of Psycholinguistic Abilities

I.D. Label	Verbal Description of Item	Item Number in Test
993	WHICH ONE GOES WITH DOCTOR	2IVM22
994	WHICH ONE GOES WITH SOLDIER	2IVM23
995	WHICH ONE GOES WITH DESIGN	2IVM24
996	WHICH ONE GOES WITH TRUCK	2IVM25
997	WHICH ONE GOES WITH STAR	2IVM26
998	WHICH ONE GOES WITH PLANE	2IVM27
999	WHICH ONE GOES WITH DESIGN	2IVM28
1000	DO YOU SMOKE	2IAD1
1001	DO YOU RUN	2IAD2
1002	DO YOU FLY	2IAD3
1003	DO YOU BARK	2IAD4
1004	DO BABIES EAT	2IAD5
1005	DO BICYCLES DRINK	2IAD6
1006	DO APPLES FLY	2IAD7
1007	DO DRESSES DRIVE	2IAD8
1008	DO BANANAS TELEPHONE	2IAD9
1009	DO BALLS BOUNCE	2IAD10
1010	DO EAGLES PAINT	2IAD11
1011	DO GOATS EAT	2IAD12
1012	DO PINCUSHIONS CHEER	2IAD13
1013	DO CHILDREN CLIMB	2IAD14
1014	DO LANTERNS SHINE	2IAD15
1015	DO DAUGHTERS MARRY	2IAD16
1016	DO DIALS YAWN	2IAD17
1017	DO BAROMETERS CONGRATULATE	2IAD18
1018	DO SCOUTS SIGNAL	2IAD19
1019	DO FRANKFURTERS FROWN	2IAD20
1020	DO BRIDES DREAM	2IAD21
1021	DO WEASELS KNIT	2IAD22
1022	DO DENTISTS DRILL	2IAD23
1023	DO PENGUINS WADDLE	2IAD24
1024	DO PIGEONS DRINK	2IAD25
1025	DO MONOGRAMS LUBRICATE	2IAD26
1026	DO CARPENTERS KNEEL	2IAD27
1027	DO MICROSCOPES MAGNIFY	2IAD28
1028	DO SYRINGES MEDITATE	2IAD29
1029	DO CANNISTERS ILLUMINATE	2IAD30
1030	DO MOLES BURROW	2IAD31
1031	DO CARBOHYDRATES NOURISH	2IAD32
1032	DO ABRASIONS COGITATE	2IAD33
1033	DO CHATEAUX CHASTISE	2IAD34
1034	DO METEORITES COLLIDE	2IAD35
1035	DO FEMALES SLUMBER	2IAD36
1036	TWO PICTURE CHIPS	2IB11
1037	TWO PICTURE CHIPS	2IB12
1038	THREE PICTURE CHIPS	2IB13
1039	THREE GEOMETRIC CHIPS	2IB14

Battery II Items (Cont'd.)

Illinois Test of Psycholinguistic Abilities

I.D. Label	Verbal Description of Item	Item Number in Test
1040	THREE GEOMETRIC CHIPS	2IB15
1041	FOUR GEOMETRIC CHIPS	2IB16
1042	FOUR GEOMETRIC CHIPS	2IB17
1043	FOUR GEOMETRIC CHIPS	2IB18
1044	FOUR GEOMETRIC CHIPS	2IB19
1045	FOUR GEOMETRIC CHIPS	2IB110
1046	FIVE GEOMETRIC CHIPS	2IB111
1047	FIVE GEOMETRIC CHIPS	2IB112
1048	FIVE GEOMETRIC CHIPS	2IB113
1049	SIX GEOMETRIC CHIPS	2IB114
1050	SIX GEOMETRIC CHIPS	2IB115
1051	BALL-LABEL	2IB21A
1052	BALL-COLOR	2IB21B
1053	BALL-COMPOSITION	2IB21C
1054	BALL-SHAPE	2IB21D
1055	BALL-FUNCTION	2IB21E
1056	BALL-OTHER INFORMATION	2IB21F
1057	CHALK-LABEL	2IB22A
1058	CHALK-COLOR	2IB22B
1059	CHALK-COMPOSITION	2IB22C
1060	CHALK-SHAPE	2IB22D
1061	CHALK-FUNCTION	2IB22E
1062	CHALK-OTHER INFORMATION	2IB22F
1063	BLOCK-LABEL	2IB23A
1064	BLOCK-COLOR	2IB23B
1065	BLOCK-COMPOSITION	2IB23C
1066	BLOCK-SHAPE	2IB23D
1067	BLOCK-FUNCTION	2IB23E
1068	BLOCK-OTHER INFORMATION	2IB23F
1069	CELLULOID-LABEL	2IB24A
1070	CELLULOID-COLOR	2IB24B
1071	CELLULOID-COMPOSITION	2IB24C
1072	CELLULOID-SHAPE	2IB24D
1073	CELLULOID-FUNCTION	2IB24E
1074	CELLULOID-OTHER INFORMATION	2IB24F

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1075	SEQUENCE CARDS-LEAF FALLING	2CDSCB
1076	SEQUENCE CARDS-WATER DRIPPING	2CDSCC
1077	SEQUENCE CARDS-MODE OF TRAVEL	2CDSCD
1078	SEQUENCE CARDS-BUILDING CONST.	2CDSCE
1079	SEQUENCE CARDS-BLOCK TOWER	2CDSCF
1080	SEQUENCE CARDS-BIRDS EATING	2CDSCG
1081	SEQUENCE CARDS-BLOW BUBBLE	2CDSCH
1082	SEQUENCE CARDS-BREAK WINDOW	2CDSCI
1083	SEQUENCE CARDS-WORK-SAVE-BUYS	2CDSCJ
1084	FIND CARDS WITH 3 RED THINGS	2CDDSA
1085	FIND CARDS WITH TWO SQUARES	2CDDSB
1086	FIND CARDS WITH THREE CIRCLES	2CDDSC
1087	FIND CARDS WITH TWO CIRCLES	2CDDAA
1088	FIND CARDS WITH THREE CIRCLES	2CDDAB
1089	FIND CARDS WITH ONE BLUE THING	2CDDAC
1090	FIND CARDS WITH FOUR CIRCLES	2CDDCA
1091	FIND CARDS WITH ONE TRIANGLE	2CDDCB
1092	FIND CARDS WITH 1 GREEN THING	2CDDCC
1093	FIND CARDS WITH NO SQUARES	2CDDYA
1094	FIND CARDS WITH ONE SQUARE	2CDDYB
1095	FIND CARDS WITH NO RED THINGS	2CDDYC

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Winter Haven Perceptual Copy Forms and Incomplete Copy Forms (1966)

I.D. Label	Verbal Description of Item	Item Number in Test
1096	COPY THIS-CIRCLE	2WPFC
1097	COPY THIS-CROSS	2WPFCR
1098	COPY THIS-SQUARE	2WPFSQ
1099	COPY THIS-TRIANGLE	2WPFTR
1100	COPY THIS-DIVIDED RECTANGLE	2WPFDR
1101	COPY THIS-HORIZONTAL DIAMOND	2WPFHD
1102	COPY THIS-VERTICAL DIAMOND	2WPFVD
1103	COMPLETE THIS-CIRCLE	2WICC
1104	COMPLETE THIS-CROSS	2WICCR
1105	COMPLETE THIS-SQUARE	2WICSQ
1106	COMPLETE THIS-TRIANGLE	2WICTR
1107	COMPLETE THIS-DIV. RECTANGLE	2WICDR
1108	COMPLETE THIS-HORIZ. DIAMOND	2WICHD
1109	COMPLETE THIS-VERTICAL DIAMOND	2WICVD

Verbal Descriptions of Battery II Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1110	WHICH BLOCK COMPLETES SQUARE	2Y242
1111	WHICH BLOCKS COMPLETE SQUARE	2Y243
1112	WHICH BLOCK COMPLETES SQUARE	2Y244
1113	WHICH BLOCKS COMPLETE SQUARE	2Y245
1114	BOWLING BALL HIT WHICH PIN 1ST	2Y247
1115	FIND HOUSE FARTHEST FROM GIRL	2Y248
1116	BOY WITH OBJECT IN SAME HAND	2Y249
1117	GIRL WITH OBJECT IN SAME HAND	2Y2410
1118	PLANT WITH OBJECT ON SAME SIDE	2Y2411
1119	POLE WITH OBJECT ON SAME SIDE	2Y2412
1120	FIND ONE THAT DOES NOT BELONG	2Y643
1121	FIND ONE THAT DOES NOT BELONG	2Y644
1122	FIND ONE THAT DOES NOT BELONG	2Y645
1123	FIND ONE THAT DOES NOT BELONG	2Y646
1124	FIND ONE THAT DOES NOT BELONG	2Y647
1125	PENCIL-FIND THING USE SAME WAY	2Y649
1126	GLOVE-FIND THING USED SAME WAY	2Y6410
1127	CANDLE-FIND THING USE SAME WAY	2Y6411
1128	LADDER-FIND THING USE SAME WAY	2Y6412
1129	STRING-FIND THING USE SAME WAY	2Y6413
1130	ROUND BLOCKS-FIND EQUAL NUMBER	2Y452
1131	FOUR PENNIES-FIND EQUAL NUMBER	2Y453
1132	FIND CAKE FOR EMPTY PLATES	2Y454
1133	FIND MUG FOR EACH CHILD	2Y455
1134	FIND BOYS FOR EACH PAIR BOOTS	2Y456
1135	FIND PICTURE OF 3RD CHILD	2Y458
1136	FIND 1 IN FRONT OF 2ND CHILD	2Y459
1137	FIND 1 IN FRONT OF 3RD CHILD	2Y4510
1138	FISH-TUNNEL-COME OUT SAME LINE	2Y4511
1139	HOW MANY BOYS GO BEFORE GIRL	2Y4512

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Arthur Adaptation of the Leiter International Performance Scale

I.D. Label	Verbal Description of Item	Item Number in Test
1140	MATCHING COLORS	3L2 1
1141	BLOCK DESIGN,HALF BLOCKS.	3L2 2
1142	MATCHING PICTURES	3L2 3
1143	MATCHING CIRCLES,SQUARES	3L2 4
1144	FOUR FORMS	3L3 1
1145	BLOCK DESIGN(TWO COLOR BLOCKS)	3L3 2
1146	PICTURE COMPLETION	3L3 3
1147	NUMBER DISCRIMINATION	3L3 4
1148	FORM, COLOR	3L4 1
1149	EIGHT FORMS	3L4 2
1150	COUNTS FOUR	3L4 3
1151	FORM, COLOR NUMBER	3L4 4
1152	GENUS	3L5 1
1153	TWO COLOR CIRCLES	3L5 2
1154	CLOTHING	3L5 3
1155	BLOCK DESIGN(DIAGONAL COLORS)	3L5 4
1156	ANALOGOUS PROGRESSION	3L6 1
1157	PATTERN COMPLETION	3L6 2
1158	MATCHING ON BASIS OF USE	3L6 3
1159	BLOCK DESIGN(QUARTER BLOCKS)	3L6 4
1160	RECONSTRUCTION (SIGMA)	3L7 1
1161	CIRCLE SERIES	3L7 2
1162	CIRCUMFERENCE SERIES	3L7 3
,1163	RECOGNITION OF AGE DIFFERENCES	3L7 4

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1164	FIND YOUNGEST CAT	3X313
1165	FIND YOUNGEST PLANT	3X314
1166	FIND YOUNGEST FACE	3X315
1167	FIND YOUNGEST PERSON	3X316
1168	THING TO RIDE-YOUNGEST PERSON	3X318
1169	WHICH SHOE-YOUNGEST PERSON	3X319
1170	WHICH DRESS-YOUNGEST PERSON	3X3110
1171	WHAT BEGINS SAME SOUND BABY	3X523
1172	WHAT BEGINS SAME SOUND DOOR	3X524
1173	WHAT BEGINS SAME SOUND POPCORN	3X525
1174	WHAT RHYMES WITH CALL	3X528
1175	WHAT RHYMES WITH HOUSE	3X529
1176	WHAT RHYMES WITH SEE	3X5210
1177	FINISH POEM-BOOK	3X5213
1178	FINISH POEM-STAR	3X5214
1179	WHICH ONE MOST LIKE LARGEST	3X124
1180	WHICH ONE MOST LIKE LARGEST	3X125
1181	WHICH ONE MOST LIKE LARGEST	3X126
1182	WHICH ONE MOST LIKE LARGEST	3X127
1183	WHICH ONE MOST LIKE LARGEST	3X128
1184	WHICH ONE MOST LIKE LARGEST	3X129
1185	WHICH ONE MOST LIKE LARGEST	3X1210
1186	WHICH ONE MOST LIKE LARGEST	3X1211
1187	WHICH ONE FINISHES STORY	3X333
1188	WHICH ONE FINISHES STORY	3X334
1189	WHICH ONE FINISHES STORY	3X335
1190	WHICH ONE FINISHES STORY	3X336
1191	WHICH ONE FINISHES STORY	3X337
1192	WHICH STORY TAKES SHORTER TIME	3X3310
1193	WHICH STORY TAKES SHORTER TIME	3X3311
1194	WHICH STORY TAKES SHORTER TIME	3X3312

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Arthur Point Scale of Performance Tests

I.D. Label	Verbal Description of Item	Item Number in Test
1195	KNOX CUBES-2 TAPS	3AK 1
1196	KNOX CUBES-2 TAPS	3AK 2
1197	KNOX CUBES-3 TAPS	3AK 3
1198	KNOX CUBES-3 TAPS	3AK 4
1199	KNOX CUBES-3 TAPS	3AK 5
1200	KNOX CUBES-3 TAPS	3AK 6
1201	KNOX CUBES-4 TAPS	3AK 7
1202	KNOX CUBES-4 TAPS	3AK 8
1203	KNOX CUBES-4 TAPS	3AK 9
1204	KNOX CUBES-4 TAPS	3AK 10
1205	KNOX CUBES-5 TAPS	3AK 11
1206	KNOX CUBES-5 TAPS	3AK 12
1207	SEGUIN FORM BOARD	3ASEQ1
1208	STENCIL DESIGN-2 CARDS	3ASD 1
1209	STENCIL DESIGN-2 CARDS	3ASD 2
1210	STENCIL DESIGN-2 CARDS	3ASD 3
1211	STENCIL DESIGN-3 CARDS	3ASD 4
1212	STENCIL DESIGN-3 CARDS	3ASD 5
1213	STENCIL DESIGN-3 CARDS	3ASD 6
1214	STENCIL DESIGN-3 CARDS	3ASD 7
1215	STENCIL DESIGN-4 CARDS	3ASD 8

Battery III Items (Cont'd.)

Arthur Point Scale of Performance Tests

I.D. Label	Verbal Description of Item	Item Number in Test
1216	STENCIL DESIGN-3 CARDS	3ASD 9
1217	STENCIL DESIGN-4 CARDS	3ASD10
1218	STENCIL DESIGN-5 CARDS	3ASD11
1219	STENCIL DESIGN-3 CARDS	3ASD12
1220	STENCIL DESIGN-5 CARDS	3ASD13
1221	STENCIL DESIGN-4 CARDS	3ASD14
1222	STENCIL DESIGN-5 CARDS	3ASD15
1223	STENCIL DESIGN-5 CARDS	3ASD16
1224	STENCIL DESIGN-5 CARDS	3ASD17
1225	STENCIL DESIGN-6 CARDS	3ASD18
1226	MAZE-2 TRIALS	3AM 1
1227	MAZE-2 TRIALS	3AM 2
1228	MAZE-2 TRIALS	3AM 3
1229	MAZE-2 TRIALS	3AM 4
1230	MAZE-2 TRIALS	3AM 5
1231	MAZE-2 TRIALS	3AM 6
1232	MAZE-2 TRIALS	3AM 7
1233	MAZE-2 TRIALS	3AM 8
1234	MAZE-2 TRIALS	3AM 9
1235	MAZE-2 TRIALS	3AM 10
1236	MAZE-4 TRIALS	3AM 11
1237	MAZE-4 TRIALS	3AM 12
1238	MAZE-2 TRIALS	3AM 13
1239	MAZE-2 TRIALS	3AM 14
1240	COMPLETE PICT.WITH RIGHT BLOCK	3AH 1
1241	COMPLETE PICT.WITH RIGHT BLOCK	3AH 2
1242	COMPLETE PICT.WITH RIGHT BLOCK	3AH 3
1243	COMPLETE PICT.WITH RIGHT BLOCK	3AH 4
1244	COMPLETE PICT.WITH RIGHT BLOCK	3AH5
1245	COMPLETE PICT.WITH RIGHT BLOCK	3AH6
1246	COMPLETE PICT.WITH RIGHT BLOCK	3AH7
1247	COMPLETE PICT.WITH RIGHT BLOCK	3AH8
1248	COMPLETE PICT.WITH RIGHT BLOCK	3AH9
1249	COMPLETE PICT.WITH RIGHT BLOCK	3AH10

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Merrill-Palmer Scale

I.D. Label	Verbal Description of Item	Item Number in Test
1250	WORD REPETITION-KITTIE	3M12A
1251	WORD REPETITION-BALL	3M12B
1252	WORD REPETITION-BIRDIE	3M12C
1253	WORD REPETITION-DINNER	3M12D
1254	IDENTIFY SELF IN MIRROR	3M13
1255	WALLIN PEG BOARD-ROUND	3M15
1256	WALLIN PEG BOARD-SQUARE	3M16
1257	DRAWING UP STRING	3M17
1258	NEST OF CUBES	3M18
1259	WHAT DOES A DOGGIE SAY	3M191
1260	WHAT DOES A KITTIE SAY	3M192
1261	WHAT DOES A AUTO SAY	3M193
1262	WHAT IS YOUR NAME	3M194
1263	WHAT IS THIS-PENCIL	3M195
1264	WHAT IS IT FOR-PENCIL	3M196
1265	WHAT IS THIS-CHAIR	3M197
1266	WHAT IS IT FOR-CHAIR	3M198
1267	WHAT IS THIS-SHOE	3M199
1268	WHAT IS IT FOR-SHOE	3M1910
1269	CUT PAPER WITH SCISSORS	3M20
1270	WORD GROUP REPETITION-NICE	3M211
1271	WORD GROUP REPETITION-DOGGIE	3M212
1272	WORD GROUP REPETITION-MY	3M213
1273	WORD GROUP REPETITION-LITTLE	3M214
1274	WORD GROUP REPETITION-BABY	3M215
1275	WORD GROUP REPETITION-SEE	3M216
1276	WORD GROUP REPETITION-THE	3M217
1277	WORD GROUP REPETITION-PRETTY	3M218
1278	WORD GROUP REPETITION-DOLLIE	3M219
1279	WORD GROUP REPETITION-GIVE	3M2110
1280	WORD GROUP REPETITION-ME	3M2111
1281	WORD GROUP REPETITION-THE	3M2112
1282	WORD GROUP REPETITION-BIG	3M2113
1283	WORD GROUP REPETITION-BOX	3M2114
1284	BUTTON ONE BUTTON	3M22
1285	PUT COLOR BALLS IN COLOR BOX	3M23R
1286	PUT COLOR BALLS IN COLOR BOX	3M23B
1287	PUT COLOR BALLS IN COLOR BOX	3M23G
1288	PUT COLOR BALLS IN COLOR BOX	3M23Y
1289	BUTTON TWO BUTTONS	3M30
1290	WHAT SLEEPS	3M331
1291	WHAT SCRATCHES	3M332
1292	WHAT FLIES	3M333
1293	WHAT BITES	3M334
1294	WHAT SWIMS	3M335
1295	WHAT BURNS	3M336
1296	WHAT CUTS	3M337

Battery III Items (Cont'd.)

Merrill-Palmer Scale

I.D. Label	Verbal Description of Item	Item Number in Test
1297	WHAT BLOWS	3M338
1298	WHAT SHOOTS	3M339
1299	WHAT MELTS	3M3310
1300	WHAT SAILS	3M3311
1301	WHAT BOILS	3M3312
1302	WHAT FLOATS	3M3313
1303	WHAT GROWLS	3M3314
1304	WHAT STINGS	3M3315
1305	WHAT GALLOPS	3M3316
1306	WHAT ACHES	3M3317
1307	WHAT EXPLODES	3M3318
1308	WHAT ROARS	3M3319
1309	WHAT MEWS	3M3320
1310	CLOSING FIST AND MOVING THUMB	3M34
1311	COUNTING TWO BLOCKS	3M35
1312	COPYING CIRCLE-3 OF 3	3M37
1313	PICTURE PUZZLE-2 PIECES	3M39
1314	LITTLE PINK TOWER-FIVE BLOCKS	3M40
1315	MARE AND FOAL	3M44
1316	OPPOSITION OF THUMB AND FINGER	3M54
1317	BUTTON FOUR BUTTONS	3M55
1318	COPYING CROSS-3 OF 3	3M56
1319	PUT MANIKIN TOGETHER	3M61
1320	PICTURE PUZZLE-3 PIECES	3M66
1321	PICTURE PUZZLE-4 PIECES	3M71
1322	COPYING STAR-1 OF 3	3M82

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Minnesota Preschool Scale

I.D. Label	Verbal Description of Item	Item Number in Test
1323	SHOW ME DOLLS EARS	3MN1A
1324	SHOW ME DOLLS CHIN	3MN1B
1325	SHOW ME THE CHAIR (PICTURE)	3MN2A
1326	SHOW ME THE APPLE (PICTURE)	3MN2B
1327	SHOW ME THE HOUSE (PICTURE)	3MN2C
1328	SHOW ME THE FLOWER(PICTURE)	3MN2D
1329	NAME OBJECT-BALL	3MN3A
1330	NAME OBJECT-WATCH	3MN3B
1331	NAME OBJECT-PENCIL	3MN3C
1332	NAME OBJECT-SCISSORS	3MN3D
1333	COPY HORIZ. STROKE	3MN4A
1334	COPY VERTICAL CROSS	3MN4B
1335	COPY DRAWINGS-CIRCLE	3MN4C
1336	COPY DRAWINGS-TRIANGLE	3MN5A
1337	COPY DRAWINGS-DIAMOND	3MN5B
1338	BUILD THREE CUBE PYRAMID	3MN6A
1339	BUILD SIX CUBE PYRAMID	3MN6B
1340	DESCRIBE PICTURE-FOUR NOUNS	3MN7AN
1341	DESCRIBE PICTURE-FOUR VERBS	3MN7AV
1342	DESCRIBE PICTURE-FOUR PREP.	3MN7AP
1343	DESCRIBE PICTURE-FOUR NOUNS	3MN7BN
1344	DESCRIBE PICTURE-FOUR VERBS	3MN7BV
1345	DESCRIBE PICTURE-FOUR PREP.	3MN7BP
1346	KNOX CUBE IMITATION-FOUR TAPS	3MN8A
1347	KNOX CUBE IMITATION-FIVE TAPS	3MN8B
1348	KNOX CUBE IMITATION-FOUR TAPS	3MN8C
1349	KNOX CUBE IMITATION-FOUR TAPS	3MN8D
1350	KNOX CUBE IMITATION-FIVE TAPS	3MN8E
1351	GIVE DOLL DRINK FROM CUP	3MN9
1352	WHAT SHOULD YOU DO WHEN HUNGRY	3MN10A
1353	WHAT SHOULD YOU DO WHEN SLEEPY	3MN10B
1354	WHAT SHOULD DO IF HOUSE AFIRE	3MN10C
1355	FIND SHAPE LIKE GIVEN	3MN11
1356	TAKE AWAY GAME-2 OBJECT	3MN12A
1357	TAKE AWAY GAME-2 OBJECT	3MN12B
1358	TAKE AWAY GAME-3 OBJECT	3MN12C
1359	TAKE AWAY GAME-3 OBJECT	3MN12D
1360	TAKE AWAY GAME-4 OBJECT	3MN12E
1361	TAKE AWAY GAME-5 OBJECT	3MN12F
1362	RECOGNITION OF FORMS-GEOMETRIC	3MN13A
1363	RECOGNITION OF FORMS-GEOMETRIC	3MN13B

Battery III Items (Cont'd.)

Minnesota Preschool Scale

I.D. Label	Verbal Description of Item	Item Number in Test
1364	RECOGNITION OF FORMS-GEOMETRIC	3MN13C
1365	NAME COLORS-RED	3MN14A
1366	NAME COLORS-BLUE	3MN14B
1367	NAME COLORS-PINK	3MN14C
1368	NAME COLORS-WHITE	3MN14D
1369	NAME COLORS-BROWN	3MN14E
1370	TRACING FORMS-CIRCLE	3MN15A
1371	TRACING FORMS-SQUARE	3MN15B
1372	TRACING FORMS-IRREGULAR	3MN15C
1373	PICTURE PUZZLES-2 PIECES-HORSE	3MN16A
1374	PICTURE PUZZLES-2 PIECES-GOAT	3MN16B
1375	PICTURE PUZZLES-4 PIECES-APPLE	3MN16C
1376	PICTURE PUZZLES-6 PIECES-CAMEL	3MN16D
1377	INCOMPLETE PICTURES-BIRD	3MN17A
1378	INCOMPLETE PICTURES-GIRL	3MN17B
1379	INCOMPLETE PICTURES-WATCH	3MN17C
1380	DIGIT SPAN-2 DIGITS	3MN18A
1381	DIGIT SPAN-3 DIGITS	3MN18B
1382	DIGIT SPAN-4 DIGITS	3MN18C
1383	PICTURE PUZZLE-2 PIECES-BIRD	3MN19A
1384	PICTURE PUZZLE-4 PIECES-FLOWER	3MN19B
1385	PICTURE PUZZLE-6 PIECE-GIRAFFE	3MN19C
1386	PAPER FOLDING-3 FOLDS	3MN20
1387	VERBAL ABSURDITIES-FRED ATE	3MN21A
1388	VERBAL ABSURDITIES-RED INK	3MN21B
1389	VERBAL ABSURDITIES-TALL GIRL	3MN21C
1390	VERBAL ABSURDITIES-HANDS COLD	3MN21D
1391	VERBAL ABSURDITIES-MORE CARS	3MN21E
1392	MUTILATED PICTURE-FOOT	3MN22A
1393	MUTILATED PICTURE-FINGER	3MN22B
1394	DEFINE FORK	3MN23A
1395	DEFINE BALLOON	3MN23B
1396	DEFINE TIGER	3MN23C
1397	DEFINE PUDDLE	3MN23D
1398	DEFINE EYELASH	3MN23E
1399	DEFINE HEALTH	3MN23F
1400	DEFINE COPPER	3MN23G
1401	OPPOSITES-COLD	3MN24A
1402	OPPOSITES-BAD	3MN24B
1403	OPPOSITES-THICK	3MN24C
1404	OPPOSITES-DRY	3MN24D
1405	OPPOSITES-DARK	3MN24E
1406	OPPOSITES-SICK	3MN24F
1407	MAKE ARMS LIKE CLOCK ARMS 8.10	3MN25A
1408	MAKE ARMS LIKE CLOCK ARMS 1.50	3MN25B
1409	MAKE ARMS LIKE CLOCK ARMS12.00	3MN25C
1410	MAKE ARMS LIKE CLOCK ARMS 1.10	3MN25D
1411	SPEECH DURING EXAM	3MN26

Verbal Descriptions of Battery III Items Used in the Investigation by Tests, I. D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1412	FIND PICT. OF THING IN STORY	3Y533
1413	FIND PICT. OF THING IN STORY	3Y534
1414	FIND PICT. OF THING IN STORY	3Y535
1415	FIND PICT. OF THING IN STORY	3Y536
1416	FIND PICT. OF THING IN STORY	3Y537
1417	FIND PICT. OF THING IN STORY	3Y538
1418	FIND PICT. OF THING IN STORY	3Y539
1419	FIND PICT. OF THING IN STORY	3Y5310
1420	STARTS WITH SAME SOUND	3Y542
1421	STARTS WITH SAME SOUND	3Y543
1422	STARTS WITH SAME SOUND	3Y544
1423	RHYMES WITH GIVEN WORD	3Y546
1424	RHYMES WITH GIVEN WORD	3Y547
1425	RHYMES WITH GIVEN WORD	3Y548
1426	RHYMES WITH GIVEN WORD	3Y549
1427	FILL IN LAST WORD OF POEM	3Y5411
1428	FILL IN LAST WORD OF POEM	3Y5412
1429	FILL IN LAST WORD OF POEM	3Y5413
1430	FIND ONE LIKE BIG PICTURE	3Y143
1431	FIND ONE LIKE BIG PICTURE	3Y144
1432	FIND ONE LIKE BIG PICTURE	3Y145
1433	FIND ONE LIKE BIG PICTURE	3Y146
1434	FIND ONE LIKE BIG PICTURE	3Y147
1435	FIND ONE LIKE BIG PICTURE	3Y148
1436	FIND ONE LIKE BIG PICTURE	3Y149
1437	FIND ONE LIKE BIG PICTURE	3Y1410
1438	FIND ONE LIKE BIG PICTURE	3Y1411
1439	FIND ONE LIKE BIG PICTURE	3Y1412
1440	FIND PICTURE TO COMPLETE STORY	3Y352
1441	FIND PICTURE TO COMPLETE STORY	3Y353
1442	FIND PICTURE TO COMPLETE STORY	3Y354
1443	FIND PICTURE TO COMPLETE STORY	3Y355
1444	FIND PICTURE TO COMPLETE STORY	3Y356
1445	WHICH STORY TAKES LESS TIME	3Y358
1446	WHICH STORY TAKES LESS TIME	3Y359
1447	WHICH STORY TAKES LESS TIME	3Y3510
1448	WHICH STORY TAKES LESS TIME	3Y3511
1449	WHICH STORY TAKES LESS TIME	3Y3512

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Oseretsky Tests of Motor Proficiency

I.D. Label	Verbal Description of Item	Item Number in Test
1450	STANDING-EYES SHUT	40 41
1451	TOUCH NOSE-EYES SHUT-EACH HAND	40 42
1452	HOP 7 TIMES IN 5 SECONDS	40 43
1453	PUT 20 COINS IN BOX	40 44
1454	CIRCLES IN AIR WITH FINGERS	40 45
1455	SQUEEZE EACH HAND THEN BOTH	40 46
1456	BALANCE ON TIP-TOE	40 51
1457	MAKE BALL WITH PAPER	40 52
1458	HOP ON 1 FOOT 5 METERS	40 53
1459	ROLL THREAD ON SPOOL-EACH HAND	40 54
1460	PUT 20 MATCHSTICKS IN BOX	40 55
1461	CLENCH TEETH	40 56
1462	STANDING ON ONE LEG	40 61
1463	THROW BALL AT TARGET	40 62
1464	JUMP OVER A ROPE	40 63
1465	DRAW 20 PERPENDICULAR LINES	40 64
1466	WALK AND ROLL THREAD ON FINGER	40 65
1467	STRIKE TABLE WITH MALLET	40 66
1468	BEND OVER WHILE ON TIP-TOE	40 71
1469	TRACE THROUGH 2 MAZES	40 72
1470	WALK LINE ONE FOOT IN FRONT	40 73
1471	PUT 36 CARDS IN 4 PILES	40 74
1472	TAP FLOOR-FEET,CIRCLES-FINGERS	40 75
1473	KNIT EYEBROWS	40 76
1474	HANDEDNESS-LEFT OR RIGHT	40 77

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1475	POINT TO PICTURE USUALLY WHITE	4X613
1476	POINT TO PICTURE USUALLY GREEN	4X614
1477	POINT TO PICTURE USUALLY RED	4X615
1478	POINT TO PICTURE USUALLY BLUE	4X616
1479	FIND OTHER THING THAT SWIMS	4X619
1480	FIND OTHER THING WITH FEATHERS	4X6110
1481	FIND SOMEONE ELSE WHO CAN TALK	4X6111
1482	FIND PICTURE WITH MORE TURTLES	4X423
1483	FIND PICTURE WITH MORE MONEY	4X424
1484	FIND PICTURE WITH LESS CARROTS	4X425
1485	FIND PICTURE WITH LESS PENNIES	4X426
1486	HOW MANY WHEN SUCKERS COMBINED	4X429
1487	HOW MANY WHEN BANANAS COMBINED	4X4210
1488	HOW MANY WHEN PENNIES COMBINED	4X4211
1489	4 CATS-HOW MANY ARE WHITE	4X4212
1490	BOY WITH ITEM IN SAME HAND	4X233
1491	BOY WITH ITEM IN SAME HAND	4X234
1492	BOY WITH ITEM ON SAME FOOT	4X235
1493	POST WITH THING ON SAME SIDE	4X236
1494	TREE WITH THING ON SAME SIDE	4X237
1495	HOW BOY LOOKING AT MARY	4X239
1496	HOW MARY LOOKING AT BOY	4X2310
1497	HOW MARY LOOKING AT BOY	4X2311
1498	WHICH CAT GOES IN EMPTY BOX	4X633
1499	WHICH MOUSE GOES IN EMPTY BOX	4X634
1500	WHICH FLOWER GOES IN EMPTY BOX	4X635
1501	WHICH RABBIT GOES IN EMPTY BOX	4X636
1502	WHAT GOES IN EMPTY BOX	4X6311
1503	WHAT GOES IN EMPTY BOX	4X6312
1504	WHAT GOES IN EMPTY BOX	4X6313
1505	WHAT GOES IN EMPTY BOX	4X6314

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Metropolitan Readiness Tests (1965)

I.D. Label	Verbal Description of Item	Item Number in Test
1506	POINT TO THE MOOSE	4MR11
1507	POINT TO THE GLOBE	4MR12
1508	POINT TO THE COLLIE	4MR13
1509	POINT TO THE WALNUT	4MR14
1510	POINT TO THE YARN	4MR15
1511	POINT TO THE PILOT	4MR16
1512	POINT TO THE AQUARIUM	4MR17
1513	POINT TO THE STONE HOUSE	4MR18
1514	POINT TO THE COMPASS	4MR19
1515	POINT TO THE MOCCASIN	4MR110
1516	POINT TO THE KNITTING	4MR111
1517	POINT TO THE TOBOGGAN	4MR112
1518	POINT TO THE SPECTACLES	4MR113
1519	POINT TO THE BLUEBERRY	4MR114
1520	POINT TO THE UMPIRE	4MR115
1521	POINT TO THE HOOF	4MR116
1522	POINT TO PICTURE ABOUT STORY	4MR21
1523	POINT TO PICTURE ABOUT STORY	4MR22
1524	POINT TO COWS WITH BELLS	4MR23
1525	POINT TO PICTURE ABOUT STORY	4MR24
1526	POINT TO PICTURE ABOUT STORY	4MR25
1527	POINT TO WHAT GROWS ON TREES	4MR26
1528	POINT TO PICTURE ABOUT STORY	4MR27
1529	POINT TO PICTURE ABOUT STORY	4MR28
1530	POINT TO PICTURE ABOUT STORY	4MR29
1531	POINT TO PICTURE ABOUT STORY	4MR210
1532	POINT TO PICTURE ABOUT STORY	4MR211
1533	POINT TO PICTURE ABOUT STORY	4MR212
1534	POINT TO PICTURE ABOUT STORY	4MR213
1535	POINT TO PICTURE ABOUT STORY	4MR214
1536	POINT TO PICTURE ABOUT STORY	4MR215
1537	POINT TO PICTURE ABOUT STORY	4MR216
1538	FIND PICTURE OF SAME LETTERS	4MR31
1539	FIND PICTURE OF SAME LETTERS	4MR32
1540	FIND PICTURE OF SAME DESIGN	4MR33
1541	FIND PICTURE OF SAME DESIGN	4MR34
1542	FIND PICTURE OF SAME LETTERS	4MR35
1543	FIND PICTURE OF SAME LETTERS	4MR36
1544	FIND PICTURE OF SAME DESIGN	4MR37
1545	FIND PICTURE OF SAME LETTERS	4MR38
1546	FIND PICTURE OF SAME LETTERS	4MR39
1547	FIND PICTURE OF SAME LETTERS	4MR310
1548	FIND PICTURE OF SAME LETTERS	4MR311
1549	FIND PICTURE OF SAME DESIGN	4MR312
1550	FIND PICTURE OF SAME DESIGN	4MR313
1551	FIND PICTURE OF SAME DESIGN	4MR314
1552	POINT TO THE S	4MR41
1553	POINT TO THE Y	4MR42
1554	POINT TO THE C	4MR43

Battery IV Items (Cont'd.)

Metropolitan Readiness Tests (1965)

I.D. Label	Verbal Description of Item	Item Number in Test
1555	POINT TO THE K	4MR44
1556	POINT TO THE E	4MR45
1557	POINT TO THE S	4MR46
1558	POINT TO THE V	4MR47
1559	POINT TO THE T	4MR48
1560	POINT TO THE N	4MR49
1561	POINT TO THE R	4MR410
1562	POINT TO THE U	4MR411
1563	POINT TO THE G	4MR412
1564	POINT TO THE F	4MR413
1565	POINT TO THE J	4MR414
1566	POINT TO THE L	4MR415
1567	POINT TO THE O	4MR416
1568	FIND THE BIGGEST APPLE	4MR51
1569	FIND WATCH THAT SAYS 3 OCLOCK	4MR52
1570	FIND HOUSE WITH 7 WINDOWS	4MR53
1571	FIND BOX WITH 12 DOTS	4MR54
1572	FIND COIN THAT BUYS MOST CANDY	4MR55
1573	FIND WHAT COSTS THE MOST	4MR56
1574	FIND THE 4	4MR57
1575	FIND 56	4MR58
1576	WRITE THE NUMBER 5	4MR59
1577	FIND WHAT COMES AFTER 8	4MR510
1578	FIND NUMBER OF CANDY BARS LEFT	4MR511
1579	FIND BUTTONS-3 AND 2 MORE	4MR512
1580	FIND PENCILS-4 AND 4 MORE	4MR513
1581	FIND SOCKS FOR 3 CHILDREN	4MR514
1582	FIND STAMPS-6 AND 1 USED	4MR515
1583	FIND MUFFINS EACH-SHARED BY 3	4MR516
1584	FIND 7TH BIRD FROM NEST	4MR517
1585	FIND GLASS HALF FULL OF MILK	4MR518
1586	FIND CIRCLE ONE-FOURTH BLACK	4MR519
1587	FIND NUMBER THAT MEANS MOST	4MR520
1588	FIND NUMBER OF PENNIES IN DIME	4MR521
1589	FIND PENNIES IN A QUARTER	4MR522
1590	FIND MORE THAN 2-LESS THAN 6	4MR523
1591	FIND MORE THAN 32-LESS THAN 46	4MR524
1592	WRITE 91	4MR525
1593	WRITE 108	4MR526
1594	COPY THE LETTERS	4MR61
1595	COPY THE LETTERS	4MR62
1596	COPY THE NUMBERS	4MR63
1597	COPY THE LETTERS	4MR64
1598	COPY THE DESIGN	4MR65
1599	COPY THE DESIGN	4MR66
1600	COPY THE DESIGN	4MR67

Battery IV Items (Cont'd.)

Metropolitan Readiness Tests (1965)

I.D. Label	Verbal Description of Item	Item Number in Test
1601	COPY THE DESIGN	4MR68
1602	COPY THE DESIGN	4MR69
1603	COPY THE DESIGN	4MR610
1604	COPY THE DESIGN	4MR611
1605	COPY THE DESIGN	4MR612
1606	COPY THE DESIGN	4MR613
1607	COPY THE DESIGN	4MR614

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Draw-A-Person Test

I.D. Label	Verbal Description of Item	Item Number in Test
1608	DAP-HEAD	4DAP 1
1609	DAP-NECK	4DAP 2
1610	DAP-NECK-2 DIMENSION	4DAP 3
1611	DAP-EYES	4DAP 4
1612	DAP-EYES-BROW OR LASHES	4DAP 5
1613	DAP-EYES-PUPIL	4DAP 6
1614	DAP-EYES-PROPORTION	4DAP 7
1615	DAP-EYES-GLANCE	4DAP 8
1616	DAP-NOSE	4DAP 9
1617	DAP-NOSE 2 DIMENSION	4DAP10
1618	DAP- MOUTH	4DAP11
1619	DAP-LIPS- 2 DIMENSION	4DAP12
1620	DAP-NOSE AND LIPS-2 DIMENSION	4DAP13
1621	DAP-CHIN FOREHEAD	4DAP14
1622	DAP-PROJECTION OF CHIN	4DAP15
1623	DAP- LINE OF JAW	4DAP16
1624	DAP-BRIDGE OF NOSE	4DAP17
1625	DAP-HAIR 1	4DAP18
1626	DAP-HAIR 2	4DAP19
1627	DAP-HAIR 3	4DAP20
1628	DAP-HAIR 4	4DAP21
1629	DAP- EARS	4DAP22
1630	DAP-EARS-PROPORTION-POSITION	4DAP23
1631	DAP-FINGERS	4DAP24
1632	DAP-FINGERS-NUMBER	4DAP25
1633	DAP-FINGERS-DETAIL	4DAP26
1634	DAP-THUMB SHOWN	4DAP27
1635	DAP-HANDS	4DAP28
1636	DAP-WRIST OR ANKLE	4DAP29
1637	DAP-ARMS	4DAP30
1638	DAP-SHOULDERS 1	4DAP31
1639	DAP-SHOULDERS 2	4DAP32
1640	DAP- ARMS-AT SIDE-ACTIVITY	4DAP33
1641	DAP-ELBOW JOINT	4DAP34
1642	DAP-LEGS	4DAP35
1643	DAP-HIP 1	4DAP36
1644	DAP-HIP 2	4DAP37
1645	DAP-KNEE JOINT	4DAP38
1646	DAP-FEET	4DAP39
1647	DAP-FEET-PROPORTION	4DAP40
1648	DAP-FEET-HEEL	4DAP41
1649	DAP-FEET-PERSPECTIVE	4DAP42
1650	DAP-FEET-DETAIL	4DAP43
1651	DAP-ARMS AND LEGS ATTACHED 1	4DAP44
1652	DAP-ARMS AND LEGS ATTACHED 2	4DAP45
1653	DAP-TRUNK	4DAP46
1654	DAP-TRUNK-PROPORTION-2 DIM.	4DAP47

Battery IV Items (Cont'd.)

Draw-A-Person Test

I.D. Label	Verbal Description of Item	Item Number in Test
1655	DAP-PROPORTION-HEAD 1	4DAP48
1656	DAP-PROPORTION-HEAD 2	4DAP49
1657	DAP-PROPORTION-FACE	4DAP50
1658	DAP-PROPORTION-ARMS 1	4DAP51
1659	DAP-PROPORTION-ARMS 2	4DAP52
1660	DAP-PROPORTION-LEGS	4DAP53
1661	DAP-PROP-LIMBS-2 DIMENSIONAL	4DAP54
1662	DAP-CLOTHING 1	4DAP55
1663	DAP-CLOTHING 2	4DAP56
1664	DAP-CLOTHING 3	4DAP57
1665	DAP-CLOTHING 4	4DAP58
1666	DAP-CLOTHING 5	4DAP59
1667	DAP-PROFILE 1	4DAP60
1668	DAP-PROFILE 2	4DAP61
1669	DAP-FULL FACE	4DAP62
1670	DAP-MOTOR COORDINATION-LINES	4DAP63
1671	DAP-MOTOR COORDINATION-JUNCT.	4DAP64
1672	DAP-SUPERIOR MOTOR COORD.	4DAP65
1673	DAP-DIRECTED LINES-FORM-HEAD	4DAP66
1674	DAP-DIRECTED LINES-FORM-TRUNK	4DAP67
1675	DAP-DIRECTED LINES-FORM-LIMBS	4DAP68
1676	DAP-DIRECTED LINES-FORM-FACE	4DAP69
1677	DAP-SKETCHING TECHNIQUE	4DAP70
1678	DAP-MODELING TECHNIQUE	4DAP71
1679	DAP-ARM MOVEMENT	4DAP72
1680	DAP- LEG MOVEMENT	4DAP73

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Peabody Picture Vocabulary Test

I.D. Label	Verbal Description of Item	Item Number in Test
1681	IDENTIFY TABLE	4PEA 1
1682	IDENTIFY BUS	4PEA 2
1683	IDENTIFY HORSE	4PEA 3
1684	IDENTIFY DOG	4PEA 4
1685	IDENTIFY SHOE	4PEA 5
1686	IDENTIFY FINGER	4PEA 6
1687	IDENTIFY BOAT	4PEA 7
1688	IDENTIFY CHILDREN	4PEA 8
1689	IDENTIFY BELL	4PEA 9
1690	IDENTIFY TURTLE	4PEA10
1691	IDENTIFY CLIMBING	4PEA11
1692	IDENTIFY LAMP	4PEA12
1693	IDENTIFY SITTING	4PEA13
1694	IDENTIFY JACKET	4PEA14
1695	IDENTIFY PULLING	4PEA15
1696	IDENTIFY RING	4PEA16
1697	IDENTIFY NAIL	4PEA17
1698	IDENTIFY HITTING	4PEA18
1699	IDENTIFY TIRE	4PEA19
1700	IDENTIFY LADDER	4PEA20
1701	IDENTIFY SNAKE	4PEA21
1702	IDENTIFY RIVER	4PEA22
1703	IDENTIFY RINGING	4PEA23
1704	IDENTIFY BAKING	4PEA24
1705	IDENTIFY CONE	4PEA25
1706	IDENTIFY ENGINEER	4PEA26
1707	IDENTIFY PEEKING	4PEA27
1708	IDENTIFY KITE	4PEA28
1709	IDENTIFY RAT	4PEA29
1710	IDENTIFY TIME	4PEA30
1711	IDENTIFY SOIL	4PEA31
1712	IDENTIFY AMBULANCE	4PEA32
1713	IDENTIFY TRUNK	4PEA33
1714	IDENTIFY SKIING	4PEA34
1715	IDENTIFY HOOK	4PEA35
1716	IDENTIFY TWEEZERS	4PEA36
1717	IDENTIFY WASP	4PEA37
1718	IDENTIFY BARBER	4PEA38
1719	IDENTIFY PARACHUTE	4PEA39
1720	IDENTIFY SADDLE	4PEA40
1721	IDENTIFY TEMPERATURE	4PEA41
1722	IDENTIFY CAPTAIN	4PEA42
1723	IDENTIFY WHALE	4PEA43
1724	IDENTIFY CASH	4PEA44
1725	IDENTIFY BALANCING	4PEA45
1726	IDENTIFY COBWEB	4PEA46
1727	IDENTIFY PLEDGING	4PEA47
1728	IDENTIFY ARGUMENT	4PEA48
1729	IDENTIFY HYDRANT	4PEA49

Battery IV Items (Cont'd.)

Peabody Picture Vocabulary Test

I.D. Label	Verbal Description of Item	Item Number in Test
1730	IDENTIFY BINOCULAR	4PEA50
1731	IDENTIFY LOCOMOTIVE	4PEA51
1732	IDENTIFY HIVE	4PEA52
1733	IDENTIFY REEL	4PEA53
1734	IDENTIFY INSECT	4PEA54
1735	IDENTIFY GNAWING	4PEA55
1736	IDENTIFY WEAPON	4PEA56
1737	IDENTIFY BANNISTER	4PEA57
1738	IDENTIFY IDOL	4PEA58
1739	IDENTIFY GLOBE	4PEA59
1740	IDENTIFY WALRUS	4PEA60
1741	IDENTIFY FILING	4PEA61
1742	IDENTIFY SHEARS	4PEA62
1743	IDENTIFY HORROR	4PEA63
1744	IDENTIFY CHEF	4PEA64
1745	IDENTIFY HARVESTING	4PEA65
1746	IDENTIFY CONSTRUCTION	4PEA66
1747	IDENTIFY OBSERVATORY	4PEA67
1748	IDENTIFY ASSISTANCE	4PEA68
1749	IDENTIFY ERECTING	4PEA69
1750	IDENTIFY THOROUGHBRED	4PEA70
1751	IDENTIFY CASSEROLE	4PEA71
1752	IDENTIFY ORNAMENT	4PEA72
1753	IDENTIFY COBBLER	4PEA73
1754	IDENTIFY AUTUMN	4PEA74
1755	IDENTIFY DISSATISFACTION	4PEA75
1756	IDENTIFY SCHOLAR	4PEA76
1757	IDENTIFY OASIS	4PEA77
1758	IDENTIFY SOLDERING	4PEA78
1759	IDENTIFY ASTONISHMENT	4PEA79
1760	IDENTIFY TREAD	4PEA80

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I.D. Label Number, and Item Number in the Test

Culture-Fair Intelligence Test (1950)

I.D. Label	Verbal Description of Item	Item Number in Test
1761	WHAT GOES UNDER EACH PICTURE	4CF11
1762	PLACE CARDS WHERE THEY BELONG	4CF21
1763	PLACE CARDS WHERE THEY BELONG	4CF22
1764	PLACE CARDS WHERE THEY BELONG	4CF23
1765	PLACE CARDS WHERE THEY BELONG	4CF24
1766	PLACE CARDS WHERE THEY BELONG	4CF25
1767	PLACE CARDS WHERE THEY BELONG	4CF26
1768	PLACE CARDS WHERE THEY BELONG	4CF27
1769	PLACE CARDS WHERE THEY BELONG	4CF28
1770	PLACE CARDS WHERE THEY BELONG	4CF29
1771	PLACE CARDS WHERE THEY BELONG	4CF210
1772	PLACE CARDS WHERE THEY BELONG	4CF211
1773	PLACE CARDS WHERE THEY BELONG	4CF212
1774	TAKE MOUSE THROUGH MAZE	4CF31
1775	TAKE MOUSE THROUGH MAZE	4CF32
1776	TAKE MOUSE THROUGH MAZE	4CF33
1777	TAKE MOUSE THROUGH MAZE	4CF34
1778	TAKE MOUSE THROUGH MAZE	4CF35
1779	TAKE MOUSE THROUGH MAZE	4CF36
1780	TAKE MOUSE THROUGH MAZE	4CF37
1781	TAKE MOUSE THROUGH MAZE	4CF38
1782	TAKE MOUSE THROUGH MAZE	4CF39
1783	TAKE MOUSE THROUGH MAZE	4CF310
1784	TAKE MOUSE THROUGH MAZE	4CF311
1785	TAKE MOUSE THROUGH MAZE	4CF312
1786	FIND PICTURE NAMED IN ROW	4CF41
1787	FIND PICTURES NAMED IN ROW-2	4CF42
1788	FIND PICTURES NAMED IN ROW-3	4CF43
1789	FIND PICTURES NAMED IN ROW-3	4CF44
1790	FIND PICTURES NAMED IN ROW-4	4CF45
1791	FIND PICTURES NAMED IN ROW-4	4CF46
1792	FIND PICTURES NAMED IN ROW-4	4CF47
1793	FIND PICTURES NAMED IN ROW-4	4CF48
1794	FIND PICTURES NAMED IN ROW-5	4CF49
1795	FIND PICTURES NAMED IN ROW-5	4CF410
1796	FIND PICTURES NAMED IN ROW-5	4CF411
1797	FIND PICTURES NAMED IN ROW-5	4CF412
1798	FOLLOWING DIRECTIONS	4CF51
1799	FOLLOWING DIRECTIONS	4CF52
1800	FOLLOWING DIRECTIONS	4CF53
1801	FOLLOWING DIRECTIONS	4CF54
1802	FOLLOWING DIRECTIONS	4CF55
1803	FOLLOWING DIRECTIONS	4CF56
1804	FOLLOWING DIRECTIONS	4CF57
1805	FOLLOWING DIRECTIONS	4CF58

Battery IV Items (Cont'd.)

Culture-Fair Intelligence Test (1950)

I.D. Label	Verbal Description of Item	Item Number in Test
1806	FOLLOWING DIRECTIONS	4CF59
1807	FOLLOWING DIRECTIONS	4CF510
1808	FOLLOWING DIRECTIONS	4CF511
1809	FOLLOWING DIRECTIONS	4CF512
1810	WRONG PICTURES-CLOCK ON HEAD	4CF61
1811	WRONG PICTURES-2 SPOUTS	4CF62
1812	WRONG PICTURES-CHIMNEY ON SIDE	4CF63
1813	WRONG PICTURES-CUP INVERTED	4CF64
1814	WRONG PICTURES-DOORKNOB	4CF65
1815	WRONG PICTURES-6 FINGERS	4CF66
1816	WRONG PICTURES-SEESAW	4CF67
1817	WRONG PICTURES-STAMP MISPLACED	4CF68
1818	WRONG PICTURES-2 RIGHT SHOES	4CF69
1819	WRONG PICTURES-BED REVERSED	4CF610
1820	WRONG PICTURES-WIND DIRECTION	4CF611
1821	WRONG PICTURES-CLOCK HANDS	4CF612
1822	ANSWER RIDDLE-LEAVES	4CF71
1823	ANSWER RIDDLE-PAPER	4CF72
1824	ANSWER RIDDLE-BIRD	4CF73
1825	ANSWER RIDDLE-KNIFE	4CF74
1826	ANSWER RIDDLE-SUN	4CF75
1827	ANSWER RIDDLE-PENNY	4CF76
1828	ANSWER RIDDLE-BROOM	4CF77
1829	ANSWER RIDDLE-GLASS	4CF78
1830	ANSWER RIDDLE-WIND	4CF79
1831	ANSWER RIDDLE-NAME	4CF710
1832	ANSWER RIDDLE-WAVE	4CF711
1833	ANSWER RIDDLE-CLOCK	4CF712
1834	FIND SAME VASE IN ROW	4CF81
1835	FIND SAME OBJECT IN ROW	4CF82
1836	FIND SAME CAT IN ROW	4CF83
1837	FIND SAME SEASHELL IN ROW	4CF84
1838	FIND SAME DESIGN IN ROW	4CF85
1839	FIND SAME DESIGN IN ROW	4CF86
1840	FIND SAME DESIGN IN ROW	4CF87
1841	FIND SAME FIGURE IN ROW	4CF88
1842	FIND SAME FACE IN ROW	4CF69
1843	FIND SAME BOAT IN ROW	4CF810
1844	FIND SAME HAND IN ROW	4CF811
1845	FIND SAME DESIGN IN ROW	4CF812

Verbal Descriptions of Battery IV Items Used in the Investigation by Tests, I. D. Label Number, and Item Number in the Test

Let's Look at First Graders

I.D. Label	Verbal Description of Item	Item Number in Test
1846	SAME SANDWICH CUT ANOTHER WAY	4Y442
1847	SAME ORANGE CUT INTO PIECES	4Y443
1848	FIND PICTURE WITH MORE GIRLS	4Y445
1849	FIND PICTURE WITH MORE MICE	4Y446
1850	FIND PICTURE WITH LESS MONEY	4Y447
1851	FIND PICTURE WITH MORE PENNIES	4Y448
1852	2 GROUPS OF DOUGHNUTS COMBINED	4Y4411
1853	2 PLATES OF CRACKERS COMBINED	4Y4412
1854	FIND PICTURE OF WHOLE COOKIES	4Y4413
1855	FIND NUMBER OF BIRDS ON FENCE	4Y4414
1856	WHICH PLANT FITS IN FLOWER POT	4Y252
1857	WHICH TURTLE FITS IN BOWL	4Y253
1858	WHICH DOG FITS THROUGH DOOR	4Y254
1859	FIND ANOTHER BOWL SAME SIZE	4Y256
1860	FIND ANOTHER GLASS SAME SIZE	4Y257
1861	FIND ANOTHER PLATE SAME SIZE	4Y258
1862	FIND ANOTHER PLATE SAME SIZE	4Y259
1863	FIND HOW MARY LOOKS AT BOY	4Y2511
1864	FIND HOW MARY LOOKS AT BOY	4Y2512
1865	FIND WHAT BOY SEES ON TABLE	4Y2513
1866	WHICH RABBIT GOES IN EMPTY BOX	4Y652
1867	WHICH FISH GOES IN EMPTY TANK	4Y653
1868	WHICH SHAPE GOES IN EMPTY BOX	4Y655
1869	WHICH SHAPE GOES IN EMPTY BOX	4Y656
1870	WHICH SHAPE GOES IN EMPTY BOX	4Y657
1871	WHICH SHAPE GOES IN EMPTY BOX	4Y658
1872	WHICH THING GOES IN EMPTY BOX	4Y6510
1873	WHICH THING GOES IN EMPTY BOX	4Y6511
1874	WHICH THING GOES IN EMPTY BOX	4Y6512
1875	WHICH THING GOES IN EMPTY BOX	4Y6513

Appendix L

Raw Score to Interval Score Conversion Tables
For All Twenty-Four Item Sets

Raw Score to Interval Score Conversion Table for Item Sets in Group I--
Sets Scaling Commonly for Advantaged and Disadvantaged Children

Raw Score	1 CAL1	2 PER1	3 NUM1	4 COL1	5 DAP4	6 FRO1	7 BIN2	8 PICW	9 MIN3
1	51	65	62	57	29	53	49	54	46
2	58	73	73	64	41	62	57	66	55
3	63	78	80	69	49	69	61	76	62
4	67	82	86	72	55	75	65	85	67
5	70	85	92	75	61	80	67	93	71
6	72	88	97	77	66	84	70	100	74
7	74	90	103	79	71	88	72	107	78
8	76	93	108	81	75	92	74	114	81
9	78	95	114	83	79	96	76	121	84
10	80	97	120	84	83	99	77	131	86
11	82	99	127	86	87	102	79	148	89
12	83	101	138	87	90	106	80		92
13	85	103		89	92	109	82		94
14	86	105		90	95	113	83		97
15	87	108		91	97	116	84		100
16	89	110		93	100	120	86		102
17	90	112		94	102	125	87		105
18	91	115		95	104	130	88		108
19	93	118		97	106	136	90		110
20	94	122		98	108	145	91		113
21	95	127		99	110		92		116
22	96	134		101	111		94		119
23	98			102	113		95		122
24	99			103	115		96		126
25	100			105	117		98		129

Raw Score to Interval Score Conversion Table for Item Sets in Group I--
(Continued)

Raw Score	1 CAL1	2 PER1	3 NUM1	4 COL1	5 DAP4	6 FRO1	7 BIN2	8 PICW	9 MIN3
26	101			107	119		99		134
27	103			108	121		100		139
28	104			110	123		102		145
29	105			112	125		103		155
30	107			113	128		105		
31	108			115	130		107		
32	109			118	133		108		
33	111			120	136		110		
34	112			122	140		112		
35	114			125	145		114		
36	115			127	153		116		
37	117			131			118		
38	118			134			121		
39	120			139			123		
40	122			147			126		
41	124						130		
42	126						134		
43	128						139		
44	131						145		
45	134						152		
46	138						160		
47	143						171		
48	150								

Raw Score to Interval Score Conversion Table for Item Sets in Group II--
Sets Scaling Uniquely for Disadvantaged Children

Raw Score	10 VBL1	11 SPA1	12 AVB2	13 AUD2	14 VMS2	15 AVC2	16 BIN1	17 INFW	18 VOCW	19 ARTW	20 LEI3	21 INF3	22 OSE4	23 PEA4	24 SHA1
1	64	62	52	34	23	-12	45	48	24	38	46	48	57	44	61
2	72	70	61	43	45	5	52	59	35	55	55	58	66	53	70
3	76	75	68	50	62	31	57	67	43	68	63	64	73	58	76
4	80	79	74	56	77	61	60	74	51	79	69	70	77	62	80
5	83	83	80	62	91	88	63	79	60	88	75	75	82	66	85
6	85	86	86	68	103	108	66	85	71	98	80	79	85	69	88
7	88	89	92	75	114	121	68	90	87	109	86	83	89	71	92
8	90	92	98	83	122	131	69	95	102	122	91	87	92	74	95
9	91	95	103	90	131	140	71	101	111	135	97	91	96	76	99
10	93	98	108	96	139	148	73	109	119	148	102	95	100	78	102
11	95	101	113	102	147	156	74	121	125	162	109	98	103	80	105
12	97	104	118	106	159	165	75	139	131		117	103	108	81	108
13	98	108	124	110		176	77	155	137		130	107	112	83	112
14	100	112	130	114			78	169	143		145	114	118	85	115
15	102	118	139	117			79		148		157	116	123	87	119
16	103	127	151	120			80		155		170	121	130	88	124
17	105	138		123			81		165			126	137	90	130
18	107	152		126			82					132	148	91	139
19	108			129			83					137		93	
20	110			132			84					144		94	
21	112			135			85					154		96	
22	115			139			86							97	
23	117			145			87							99	
24	120			152			88							100	
25	124						89							101	
26	129						89							103	
27	136						90							104	
28							91							106	
29							92							107	
30							93							109	

Raw Score to Interval Score Conversion Table for Item Sets in Group II--
(Continued)

Raw Score	10 VBL1	11 SPA1	12 AVB2	13 AUD2	14 VMS2	15 AVC2	16 BIN1	17 INFW	18 VOCW	19 ARTW	20 LEI3	21 INF3	22 OSE4	23 PEA4	24 SHA1
31							94							110	
32							94							111	
33							95							113	
34							96							114	
35							97							116	
36							98							117	
37							98							119	
38							99							121	
39							100							122	
40							101							124	
41							102							126	
42							103							128	
43							103							131	
44							104							133	
45							105							136	
46							106							140	
47							107							145	
48							108							152	
49							109								
50							110								
51							111								
52							112								
53							113								
54							114								
55							115								
56							116								
57							117								
58							118								
59							120								
60							121								

Raw Score to Interval Score Conversion Table for Item Sets in Group II--
(Continued)

Raw Score	10 VBL1	11 SPA1	12 AVB2	13 AUD2	14 VMS2	15 AVC2	16 BIN1	17 INFW	18 VOCW	19 ARTW	20 LEI3	21 INF3	22 OSE4	23 PEA4	24 SHA1
61							122								
62							124								
63							125								
64							127								
65							129								
66							131								
67							133								
68							135								
69							137								
70							140								
71							143								
72							147								
73							152								
74							160								